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Vote on the Pharmacy Headquarters Is Now Being Taken—Its Selection Will Mark the Diamond Anniversary Meeting of the American Pharmaceutical Association.

Vol. XVI, No. 2 FEBRUARY, 1927

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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Published Monthly by the American Pharmaceutical Association: Office of publication, 20th & Northampton Sts., Easton, Pa. Editorial Office, 10 West Chase Street, Baltimore, Md.

Annual Subscription, $4.00; Single Numbers 35 Cents.

THE SEVENTY-FIFTH ANNUAL CONVENTION—THE DIAMOND ANNIVERSARY MEETING—WILL BE HELD IN ST. LOUIS.

The 1927 Meetings of the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy will also meet in St. Louis, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, see pages x, xii, xiv and xvi.

For Roster of Officers of Pharmaceutical Assoc.—State and National, see pages xvi, xvii and xix.

Entered as second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103. Act of October 3 1917; authorized July 10, 1918.

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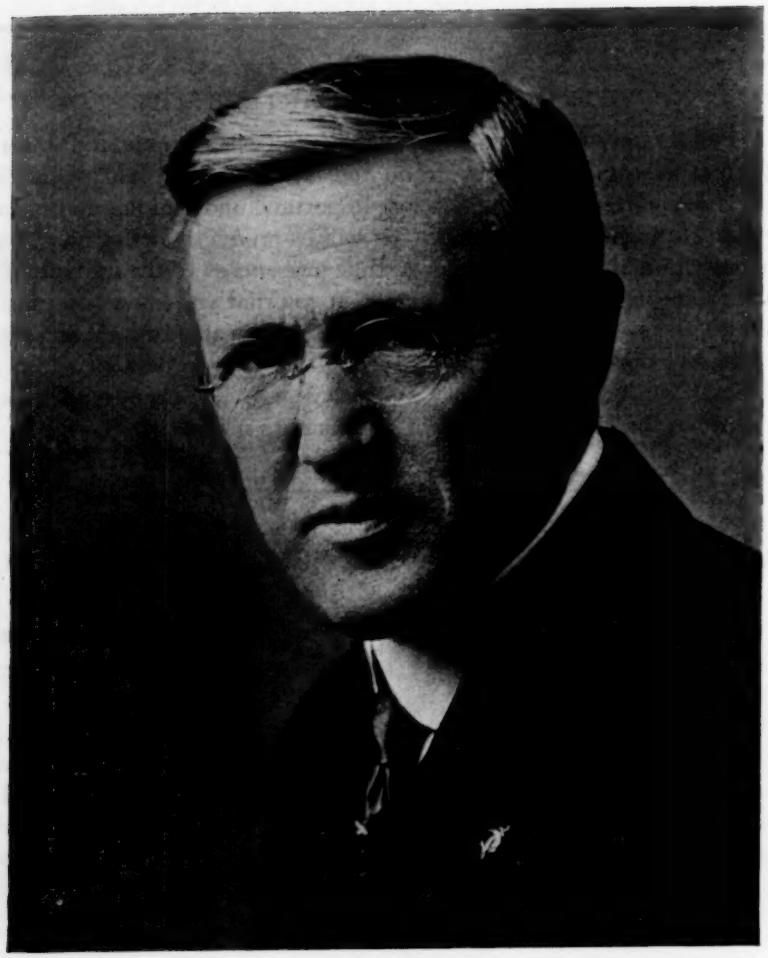
VOTE ON THE HEADQUARTERS SITE.

Ballots have been mailed to members of the AMERICAN PHARMACEUTICAL ASSOCIATION for vote on the location of the Headquarters. The Headquarters project is a most important undertaking and of far-reaching influence for Pharmacy. It will be productive of results which are only limited by the willingness, time and energy of the individual of whom someone has said: "It's the big in you that you know you can be. And it's the great outside of you that you know is able to come to pass."

Show your interest by voting promptly—it is to be hoped that all members will exercise the duty and privilege. The number of ballots cast prove the general interest of pharmacists in pharmacy.

CONTRIBUTIONS TO THE MUSEUM AND LIBRARY OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Friends and members of the AMERICAN PHARMACEUTICAL ASSOCIATION who contemplate giving or bequeathing books, manuscripts and articles of historical value are respectfully asked to enclose them in boxes or packages and mark them "for the AMERICAN PHARMACEUTICAL ASSOCIATION" and forward them to the Historian, 10 West Chase Street, Baltimore. This is in accord with a vote of the Section on Historical Pharmacy, at the recent Philadelphia meeting. Due acknowledgment will be made. The time to give this matter attention is "as soon as possible"—otherwise, the request may be forgotten.—Thank you!



CHARLES W. JOHNSON.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVI FEBRUARY, 1927 No. 2

CHARLES WILLIS JOHNSON.

In 1923 the President-Elect of the AMERICAN PHARMACEUTICAL ASSOCIATION was chosen presiding officer of the American Conference of Pharmaceutical Faculties (now the American Association of Colleges of Pharmacy). He will preside over the seventy-sixth annual meeting of the A. PH. A., during the year which marks the "silver" anniversary of his membership in the ASSOCIATION.

Charles W. Johnson was born in Indiana about fifty-three years ago and received his early education in the "Hoosier State" and here also, for a time, he taught in the public schools. His B.S., Ph.C., and Ph.D. degrees were earned at the University of Michigan. For several years he practiced pharmacy in Ann Arbor and Detroit. He was also instructor in chemistry at his *Alma Mater* and, later, at the University of Iowa. In 1903, the University of the State of Washington elected him Professor of Pharmaceutical Chemistry and Dean of its College of Pharmacy where, next year, he will enter on his twenty-fifth year of service.

The President-Elect recognizes the value of associations and participates actively in the work; he served for two terms as President of the Washington State Pharmaceutical Association and, as stated, as President of the A. C. P. F. His interest in and attachment to organizations is attested by his regular attendance at the annual meetings, and this means, frequently, a trip from coast to coast. He is a member of the Committee of Revision of the United States Pharmacopœia.

Professor Johnson realizes that the progress of pharmacy is dependent upon the coördinated coöperation of all engaged in its related divisions. Having been trained in several of these activities, his experience and learning will be helpful in shaping the affairs of the AMERICAN PHARMACEUTICAL ASSOCIATION, which from its beginning has been deeply concerned in making the working together of pharmaceutical organizations of greatest value for the individuals in the service of the public. With few exceptions, if any, the presidents of the A. PH. A. have had this point of contact which enabled them to value the importance of all the underlying branches of pharmacy and the drug business.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

VOTE ON THE HEADQUARTERS.

THE ballots for voting on the location of the A. PH. A. Headquarters have been sent out. It is to be hoped that every member of the ASSOCIATION will exercise his privilege and duty by expressing his or her preference relative to the location of the Headquarters, for which invitations have been received from Chicago, Cincinnati, Cleveland, Columbus, Madison, New York, Omaha, St. Louis and Washington. The last-named city has been endorsed by all drug and pharmaceutical organizations of Maryland, by New York Branch, A. PH. A., by Philadelphia Branch, A. PH. A., by Vermont Pharmaceutical Association, and by the Executive Council of Virginia Pharmaceutical Association. Instead of abstracting the letters conveying the invitations Secretary Kelly has had them printed *in extenso* so that each voter can, after studying them, act according to his or her judgment, in the interest of American Pharmacy. The city in which the Headquarters Building is to be located is to be chosen by the membership in accordance with the democratic theory and practice of the AMERICAN PHARMACEUTICAL ASSOCIATION, after a consideration of the claims and advantages of the several cities seeking to become the site of the Headquarters, and of which the members have been advised.

This comment will not advance the claims of any city but urges that every member vote, so that the wish of the majority may be expressed, and, thereby, a corresponding interest in pharmacy and in the great promotion of the AMERICAN PHARMACEUTICAL ASSOCIATION. Only a few years ago the success of such an undertaking would have been deemed impossible—to-day it is assured—the nearly $600,000 in pledges, of which an amount of $232,000 is represented by cash prompted last month's slogan of the JOURNAL that "the A. PH. A. Headquarters is an expression of yesterday's forethought and to-day's assurance."

The hardquarters fund represents a confession of faith of pharmacists in pharmacy—the returns of the vote will exhibit their interest in the headquarters and in pharmacy—others will judge the vote as an expression by pharmacists of their belief in the mission of pharmacy and its greater opportunities. "Vision is an attribute of character." Do your duty by promptly sending in your vote!

The interest and generosity expressed by the invitations should, and will, we hope, prompt you to read the messages carefully and vote without delay so the selection of the site may proceed according to the plan outlined for taking the vote.

Read again the message of Chairman James H. Beal, printed in the January number of the JOURNAL for 1924, pages 5 and 6. The April number of the same volume abounds with commendations of the headquarters project and the happenings of every year add further arguments for the why of its establishment. Coördination of efforts in the interest of Public Health, as well as among the elements

within industries and by interests that unprofitably compete constitute problems that may be solved for the common good. The AMERICAN PHARMACEUTICAL ASSOCIATION is a Service Organization and seeks to serve all divisions of the drug trade and of pharmacy. E. G. E.

THE DRUGGISTS' RESEARCH BUREAU.

PROPERLY coördinated coöperation among those engaged in related lines should bring about benefits that cannot be gained otherwise. Last month an organization was effected of the Druggists' Research Bureau, sponsored by the National Wholesale Druggists' Association, approved by the National Association of Retail Druggists and the American Association of Colleges of Pharmacy.

The plan of the organization is broad enough to include in its membership individuals of every division of the drug trade and of pharmacy. It was formulated by the National Wholesale Druggists' Association based on a survey, the substance of which is embodied in the presentation of certain facts or conditions that are to be studied for general good, among them the following:

"The retailer and his clerk are interested in the facts pertaining to their business. The retailer has made his investment and desires that it produce a fair return. The clerk has chosen the retail drug business for his profession. He has spent several years in gaining practical experience and in college to fit him to become a retailer, and he desires these facts in order to keep the retail drug industry in the public's favor.

"The successful salesmen to-day are business men, and they desire the retailers' facts in order to confer with them intelligently. The wholesalers and manufacturers are constantly securing these facts in order to serve the individual retail druggist in the most practical and sensible manner. Upon the teaching in the colleges of pharmacy depend the pharmacists of the future, so that they desire the facts pertaining to the drug industry.

"National, State and local drug associations desire accurate information for their members. Publishers of trade magazines, advertising agencies, and all those marketing in the drug industry desire these facts."

The first studies to be undertaken are: (1) The sales value of the retail drug store window display. (2) Personal selling. (3) Simplification of stock as a means of increasing turnover and profit. Each of the above three topics is to be sent out accompanied by a concrete statement as to the necessity for such investigation.

There is no question relative to the value of the proposed research, but it may be well to consider the advisability and practicability of doing the work within the AMERICAN PHARMACEUTICAL ASSOCIATION instead of creating another organized national activity of pharmacy and the drug industries. The AMERICAN PHARMACEUTICAL ASSOCIATION always seeks to serve and be helpful and therefore the suggestion.

Excercise your duty and privilege of voting on the location of the American Pharmaceutical Association Headquarters.

SCIENTIFIC SECTION

EFFECT OF POLARIZED LIGHT ON THE PHARMACODYNAMIC PROPERTIES OF SOME DRUGS.*

BY D. I. MACHT AND J. C. KRANTZ, JR.

In connection with a study of the effect of various radiations on the activity of different pharmacological agents carried on by the senior author,[1] studies were made on the effect of *polarized light* on a number of drugs. These studies have led to some observations, which, on account of their importance, have been very carefully repeated and checked with all kinds of control experiments during the past two years. The results obtained have been so clear-cut that it is deemed desirable to announce them briefly on three drugs: Tincture of Digitalis—a galenical preparation, and two crystalline alkaloids, cocaine and quinine.

Polarized light was obtained by two methods: A Nicol Prism and piles of plates. The Nicol Prism most frequently used in the present experiments was a large one, 12 cm. long and $3^1/_2$ cm. in diameter. Different sources of light were employed with this instrument: in some cases, small Mazda electric bulbs, in other cases, a Krohmayer Mercury Vapor Lamp with a collar adjustment made to fit the aperture of the prism, and in still other cases, an ordinary large pocket flash lamp. With a Krohmayer Lamp, spectroscopic examination showed, as may be expected, that all the ultraviolet rays were cut out by the Nicol Prism, but a visible light of powerful intensity was secured. In control experiments when working with a Nicol Prism, non-polarized light of equal intensity was obtained from a similar source. In some of the control experiments, the non-polarized light was intentionally made slightly greater in intensity, or the exposure to it was purposely made longer than with polarized light.

The other apparatus used in obtaining polarized light was a special one constructed by Macht and Pfund, which is described in full elsewhere.[2] It consists, briefly, of a large box or cell in the form of a truncated pyramid and is divided into two compartments. At the upper end of the cell a socket is fixed into which is inserted a large round Mazda tungsten nitrogen electric bulb, of 500-watt power, which serves as a source of light. The light of this lamp is allowed to penetrate into one chamber after passing through a pile of a dozen plates of smooth glass placed at a "polarizing" angle, so that this chamber becomes illuminated with a high percentage of plane polarized light. The light from the same lamp penetrates the other chamber through a pile of glass plates placed perpendicular to the line of propagation of the light, so that the second chamber is illuminated with non-polarized light. The number of plates in this second pile is so adjusted as to make the intensity of light in each chamber the same.

Experiments with Digitalis.—Tincture of Digitalis was placed in two hard glass test-tubes or flasks, and the contents of the two containers were repeatedly poured from one into the other so as to make the tincture contained in each abso-

* The first announcement of this investigation was made at the regular meeting of the Johns Hopkins Medical Society, January 25, 1926.

[1] D. I. Macht, *Proc. Soc. Exptl. Biol. Med.*, 22, 471 (1925); 23, 638 (1926).

[2] D. I. Macht, *J. Gen. Physiol.*, 10, 41 (1926).

lutely the same. Such tinctures were irradiated simultaneously with polarized and non-polarized light of exactly the same intensity, in some cases using the Nicol Prism, in others using the glass-plate apparatus. After exposure for various periods of time ranging from thirty minutes to four, five or six hours, the tinctures were carefully assayed, and their potency was compared with each other and with that of the original tincture from which the specimens were taken. In assaying the Digitalis tinctures, both zoöpharmacological and phytopharmacological methods were employed. The animal test used in most cases was the cat method which is generally recognized as the most useful one for Digitalis assay, and gives fairly reliable results in experienced hands. The phytopharmacological method employed was that of Macht and Krantz, described fully elsewhere; it has certain advantages over the cat method, the principal one being that it gives smaller variations in the data obtained.[1] In addition to these standard methods of assay, in some experiments the tinctures were tested on frogs, and frogs' hearts, and also occasionally by the goldfish method. It was found that even a comparatively short exposure of tincture of Digitalis to polarized light obtained by the method described above *produced a distinct deterioration in the potency* of the drug as indicated by all of the methods of assay that have been tried. Thus, for instance, even an exposure of forty-five minutes to one hour was sufficient to produce a deterioration in the polarized specimen, amounting to 10% or more, as compared with a non-polarized specimen. The specimen exposed to non-polarized light was often irradiated for a longer time than the polarized specimen, and with light of somewhat greater intensity. Nevertheless, even in such experiments the polarized light showed a greater deterioration. In fact, exposures of the tincture to non-polarized light for one hour produced hardly any change in the control experiments, as compared with the original stock tincture. The following protocols are fair illustrations of the results obtained by the authors.

Experiment No. 101.

Tincture Digitalis. Effect of 0.5% solution on growth of *Lupinus albus.*

Original non-radiated tincture, index of growth 54%.
Irradiated through Nicol Prism K. lamp for one hour, index of growth 69%.
Control irradiated with non-polarized light of same intensity, index of growth 57%.
Note: The greater the potency of tincture Digitalis, the smaller the index or coefficient of growth.

Experiment No. 106.

Tincture Digitalis. Effect of 0.5% solution on growth of *Lupinus albus.*

Original non-irradiated tincture, index of growth 70%.
Tincture in Polarizing Chamber of glass-plate apparatus, four hours, index of growth 84%.
Control in Non-Polarizing Chamber, index of growth 71%.

Experiment No. 10.

Tincture Digitalis. 1:10 Assay on cats. Average of three.

Original non-radiated tincture, lethal dose 9.2 cc. per kilo.
Irradiated through Nicol Prism K. lamp, one hour, lethal dose 13.0 cc. per kilo.
Control with non-polarized light, lethal dose 10.0 cc. per kilo.

---

[1] D. I. Macht and J. C. Krantz, Jr., JOUR. A. PH. A. (1927) in press.

Experiment No. 16.

Tincture Digitalis. 1:10 Assay on cats. Average of three.

Original non-radiated tincture, lethal dose 9.5 cc. per kilo.

Irradiated six hours in polarizing chamber of glass-plate apparatus. Apparatus T° 26° C., lethal dose 14.9 cc. per kilo.

Non-polarized control six hours T° 26° C., lethal dose 12.6 cc. per kilo.

Experiments with Cocaine.—Solutions of cocaine hydrochloride were employed in most of the experiments, but a number were also made with the poorly soluble alkaloid itself, dissolved in distilled water. The solutions were irradiated as above, both with the Nicol Prism, and with the glass-plate apparatus. In testing the pharmacological activity of the solutions, two new methods, one phytopharmacological and the other zoöpharmacological were devised, which will be described in detail elsewhere. The phytopharmacological method takes advantage of the marked difference in toxicity for plant protoplasm noted by Macht and Livingston[1] in connection with a study of cocaine and its decomposition products. These authors found that, whereas cocaine is but slightly toxic for plants, one of its decomposition products, namely, benzoic acid, is extremely toxic for plant protoplasm. By taking advantage of this reaction it is possible to evaluate the pharmacological potency of cocaine solutions, even in extremely great dilutions, such as could hardly be distinguished by chemical means. The zoöpharmacological tests for evaluation of cocaine solutions were made by experiments on goldfish. The authors found that goldfish are very sensitive to even very dilute solutions of cocaine hydrochloride (1:5000 or less). By noting the time of onset of anesthesia and paralysis of fish when placed in such solutions, their comparative potency can be easily determined.

In addition to these pharmacological methods, of studying the deterioration of cocaine, the authors also determined the hydrogen-ion concentration before and after irradiation. By means of these tests it was found that irradiation of cocaine solutions even for short periods of time *produced marked deterioration in their potency*, as indicated both by the plant and animal tests, and also by changes in the hydrogen-ion concentration. The non-polarized controls showed very little or no difference, as compared with the original stock solutions. The following protocols will serve as illustrations.

EXPERIMENT, DECEMBER 22, 1926.

A fresh solution of cocaine hydrochloride 1:1000 was made in distilled water. Twelve cc. of solution was irradiated through a Nicol Prism with a small Mazda electric bulb of 15 watts for 45 minutes. Another portion was irradiated with non-polarized light of same intensity for 50 minutes.

Hydrogen-Ion Determination:

Original solution, p_H 5.1.
Polarized specimen, p_H 4.9.
Non-polarized specimen, p_H 5.1.

Plant Test: Lupinus Albus.

Original solution, 1:10,000, index of growth 95%.
Non-polarized specimen, 1:10,000, index of growth 95%.

[1] D. I. Macht and Livingston, *J. Gen. Physiol.*, 4, 573 (1922).

Polarized specimen, 1:10,000 index of growth 82%.
Note: The more cocaine is decomposed, the *greater* the toxicity for plants.

Animal Test: Goldfish.

In non-polarized solution 1:5000, is paralyzed in 6 minutes.
In polarized solution 1:5000, is paralyzed in 16 minutes.
Note: The more cocaine is decomposed the *less* is its toxicity for animals.

EXPERIMENT, DECEMBER 23, 1926.

Freshly prepared solutions of cocaine hydrochloride 1:1000 in distilled water. Two portions were irradiated for one hour in glass-plate apparatus, one in polarized light, the other in non-polarized light of the same intensity, temperature of both being 26° C.

Hydrogen-Ion Determination:

Original solutions 1:1000, p_H 5.1.
Specimen exposed to non-polarized light, p_H 5.1.
Specimen exposed to polarized light, p_H 4.9.

Plant Test: Lupinus albus.

Original solution, index of growth 90%.
Polarized specimen, index of growth 80%.
Non-polarized specimen, index of growth 88%.

Animal Test: Goldfish.

In non-polarized specimen 1:5000 paralyzes in 6 minutes.
In polarized specimen 1:5000 no change after 25 minutes.

Experiments with Quinine.—Experiments were made with quinine sulphate and quinine tartrate by radiating solutions, as in the case of Digitalis and cocaine. In this case the activity of the quinine was tested quantitatively by the plant method, as already described by the senior author.[1] It was found that here also polarized light produced a change in the quinine solution whereas the non-polarized controls showed very little change. A few determinations were made on the optic activity of the quinine solutions. Here it was also found, by physical means with the polariscope, that the polarized specimen underwent a change, whereas the non-polarized one was but slightly affected by ordinary light. The following protocol will serve as an illustration.

EXPERIMENT, OCTOBER 7, 1926.

Solutions of quinine tratrate 1%, especially prepared by Fitzgerald Dunning. Two portions of this are irradiated for 2 hours in the two chambers of glass-plate apparatus T° 26° C.

Plant Test: Lupinus albus.

Original quinine tartrate solution, 1:100,000, index of growth 77%.
Specimen exposed to ordinary light, 1:100,000, index of growth 77%.
Specimen exposed to polarized light, 1:100,000, index of growth 87%.
Note: The more deterioration in quinine, the *less* the toxicity for plants.

Polariscopic examination of original solution gave a reading of —8° 41′.
Polariscopic examination of non-polarized solution gave a reading of —8° 42′.
Polariscopic examination of polarized solution gave a reading of —8° 25′.

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[1] D. I. Macht, *Proc. Soc. Exptl. Biol. Med.*, 20, 35 (1922).

The results described above may be summarized as follows: Irradiation of tincture of Digitalis, and solutions of cocaine and quinine with polarized light produces a change in their pharmacological activity. Such a change or deterioration occurs even after short exposures to such light, and is not produced to the same degree, even by longer exposures to ordinary non-polarized light. A most remarkable feature of this phenomenon is that such effects are produced by the *ordinary or long and visible light waves*. Studies on the effects of polarized light on other drugs are in progress. Experiments are also in progress with the object of determining more intimately the mechanism of the above phenomenon. Other studies are also being planned on the effects of polarized ultraviolet rays, and of circularly polarized light.

FROM THE PHARMACOLOGICAL RESEARCH LABORATORY,
HYNSON, WESTCOTT AND DUNNING,
BALTIMORE, MARYLAND.

THE EFFECT OF ULTRAVIOLET AND POLARIZED LIGHT ON MERCUROCHROME.

BY DAVID I. MACHT AND JUSTINA H. HILL.

INTRODUCTION.

Since the introduction of Mercurochrome-220 into therapeutics, the use of this antiseptic has become so extensive that any additional information concerning its clinical and pharmacological properties is deemed desirable. Inasmuch as light very frequently produces changes in the potency of many drugs it was deemed desirable to inquire into effects, if any, of various radiations on solutions of Mercurochrome. With this end in view the present investigation was undertaken. In order to determine the effect of various rays on the drug a solution of Mercurochrome 1:500 was irradiated with Mercury Vapor Quartz Lamps and the germicidal efficiency of the solution tested on bacteria according to the method described below.

METHOD.

Irradiation with ultraviolet rays was performed in two ways. In some experiments the Hanovia Alpine Sun Lamp was employed. This well-known apparatus is an air-cooled quartz lamp emitting wave-lengths as short as 1850 Angstrom units. In other experiments the water-cooled Krohmayer Quartz Lamp (Hanovia) was employed. This lamp does not emit any heat waves and the shortest waves produced by it are about 2000 Angstrom units.

Solutions of Mercurochrome were radiated in three kinds of containers. In some experiments the solution was exposed to the radiation in an ordinary soft glass test-tube. In other experiments the drug was radiated in Pyrex test-tubes and in still other experiments in order to obtain the action of the shortest ultraviolet rays the solutions were exposed to the lamps in clear quartz test-tubes. Spectrographic examination of the glass tube showed that it transmitted wave-lengths of only 3000 Angstrom units and longer; the Pyrex Glass transmitted wave-lengths as short as 2820 Angstrom units.

Two series of experiments were performed. In the first series the duration of exposure to the radiation was thirty minutes. In the second series the duration of exposure was one hour and eighteen minutes.

The potency or efficiency of Mercurochrome was tested in the following manner. Two cc. of the drug 1:500 was inoculated with one standard loopful of a twenty-four hour B. Coli culture. At the end of the exposure time, 0.1 cc. of the drug-and-organisms, mixture was removed by means of a sterile capillary pipette and transfered to 5 cc. of the sterile broth. Inasmuch as controls proved that in the transfer enough drug was carried over to prevent growth a second transfer of 1 cc. was made to 9 cc. of broth. A control of this method of dilution showed that prompt and heavy growth was obtained with these dilutions in the exposure of the drug, while the amount of drug present in the second transfer tube was not sufficient to visibly inhibit the growth of the organisms. The exposure time for the organisms studied was 1, 2, 3, 4 and 5 minutes.

RESULTS.

The findings or the results obtained are expressed in the subjoined table and are very clear cut and definite. It is evident from the data obtained that ultraviolet radiation of Mercurochrome solutions 1:500 *produced no appreciable deterioration in the potency of the drug.*

EXPERIMENTS WITH POLARIZED LIGHT.

Recent work by Macht and co-workers called attention to the fact that important biological changes may be produced by polarized light. In another publication to appear elsewhere[1] it will be shown that polarized light, even of the visible spectrum, produced marked deterioration in a number of well-known drugs as regard their pharmacological potency or activity. In a study of the effects of light on Mercurochrome it was, therefore, thought desirable to inquire into effects of polarized light upon solutions of the drug. Experiments with polarized light were performed in two ways. In one series of experiments light was polarized by passing through a large Nicol Prism 2.5 cm. in diameter using a Krohmayer Lamp as the source of light. The shortest rays transmitted by the Nicol Prism are found spectroscopically to be about three thousand Angstrom units. In another series of experiments polarized light was obtained by a special apparatus constructed by Prof. A. H. Pfund and the senior author utilizing the well-known principle of a pile of glass plates. This apparatus is described in full in another publication.[2] It consists of two chambers or compartments in one of which polarized light of the visible spectrum is obtained and in the other non-polarized light of the same intensity and the same temperature is utilized from the same source for control experiments. Solutions of Mercurochrome 1:500 were irradiated by both methods, the results obtained were very interesting. They were absolutely negative. No deterioration was produced in Mercurochrome by exposure to the polarized light.

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[1] JOUR. A. PH. A., this issue, p. 106.

[2] D. I. Macht, *J. Gen. Physiol.*, **10**, 41 (1926).

SUMMARY.

The results of the present investigations can be summarized very succinctly. Irradiation by powerful mercury vapor lamps both of the air-cooled and the water-cooled variety produced no deterioration in the antiseptic or germicidal potency of Mercurochrome solutions. Irradiation or exposure to polarized light also produced no change in the potency of Mercurochrome solution.

IRRADIATION OF MERCUROCHROME-220 IN SOLUTION 1:500.

No. of exper.	Form of radiation.	Exposure time. 1 minute.	2 minutes.	3 minutes.	4 minutes.	5 minutes.	Inhibition controls.
1	Normal Mercurochrome (Ice Box).	1 Sterile 1 Grew	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
2	Krohmayer Lamp. Quartz Test-tube. 30 minutes' radiation.	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
3	Krohmayer Lamp. Pyrex Test-tube. 30 minutes' radiation.	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
4	Krohmayer Lamp. Soft Glass Tube. 30 minutes' radiation.	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
5	Alpine Sun Lamp. Quartz Test-tube. 30 minutes' radiation.	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
6	Alpine Sun Lamp. Soft Glass Tube. 30 minutes' radiation.	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
7	Normal Mercurochrome. Not radiated (Ice Box).	1 Sterile 1 Grew	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
8	Krohmayer Quartz Test-tube. 1 hour 18 minutes' radiation.	1 Sterile 1 Grew	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
9	Krohmayer Lamp. Soft Glass Tube. 1 hour 18 minutes' radiation.	2 Sterile				2 Sterile	1 Grew
10	Alpine Sun Lamp. Quartz Test-tube. 1 hour 18 minutes' radiation.	1 Sterile 1 Grew				2 Sterile	1 Grew
11	Alpine Sun Lamp. Pyrex Test-tube. 1 hour 18 minutes' radiation.	2 Sterile				2 Sterile	1 Grew
12	Alpine Sun Lamp. Soft Glass Tube. 1 hour 18 minutes' radiation.	2 Sterile				2 Sterile	1 Grew
13	Polarized Light. Krohmayer Lamp. Nicol Prism Glass Tube. 30 minutes' radiation.	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
14	Polarized Light. Nicol Prism Pyrex Tube Krohmayer Lamp. 1 hour 18 minutes.	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
15	Polarized Light. Nicol Prism Pyrex Tube Krohmayer Lamp. 1 hour 18 minutes.	1 Sterile 1 Grew	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
16	Polarized Light. Macht-Pfund Apparatus. 1 hour T° 25° C.	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew

17	Non-Polarized Macht-Pfund Apparatus. 1 hour T° 25° C.	Control	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Sterile	2 Grew
18	Polarized Light. Macht-Pfund Apparatus. 4 hours. T° 25° C.		1 Sterile 1 Grew				2 Sterile	1 Grew
19	Non-Polarized Macht-Pfund Apparatus. 4 hours T° 25° C.	Control	2 Sterile				2 Sterile	1 Grew
20	Dilution Controls.							4 Grew

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THE COLORIMETRIC ASSAY OF STROPHANTHUS.*

BY L. W. ROWE.

Although a complete account of the application by Knudson and Dresbach (1) and (2) of the Baljet reaction (3) to the colorimetric testing of strophanthus preparations was apparently never published, it was shown in the short abstract available, that the same technique was used as in testing digitalis preparations; that ouabain was used as a standard; and that comparison with the Hatcher Cat Method was entirely satisfactory from the standpoint of accuracy.

In spite of unsuccessful results with the colorimetric assay of digitalis preparations, (4) the application of the method to strophanthus seemed promising since such dilute solutions could be used that it would be unnecessary to subject them to the purifying process. Also ouabain or Tr. Strophanthus should be suitable as standards. Accordingly short series of tests were made on the same preparations by both the colorimetric and the Houghton frog methods. Since the drug differs from digitalis even though closely related in pharmacological and therapeutic action and since the results obtained were somewhat more favorable it was considered advisable to make a separate report of these tests rather than include them in the more extended series of digitalis tests.

TABLE I.

Preparation.	Standard.	Color test.	Frog test.	Color error.
Ouabain A	Ouabain X	100%	73%	27% high
Ouabain B	Ouabain X	78%	61%	22% high
Ouabain C	Ouabain X	140%	61%	56% high
Ouabain C	Ouabain X	100%	61%	39% high
Ouabain X (U. S. P. X)	Digitalin	100%	73%	27% high
Tr. Stroph. 1890	Ouabain X	50%	50%	
Tr. Stroph. 781,111	Digitalin	215%	155%	28% high

In this series four different lots of ouabain were compared by the two methods, a 1 to 25,000 solution being used in the color tests and no purification made. In each color test of ouabain "C" the result was very high and the two results did not agree at all closely. However, this was the first series and later comparisons were more satisfactory. It was found in this series that a U. S. P. 1890 tincture,

* Scientific Section, A. PH. A., Philadelphia meeting, 1926.

which was being used as a standard in the frog tests, was equivalent to the 1–25,000 solution of standard ouabain X when diluted 1 to 70.

TABLE II.

Preparation.	Standard.	Color test.	Frog test.	Color error.
Tr. Stroph. 781,642	Tr. S. 1890	100%	120%	20% low
Tr. Stroph. 770,265	Tr. S. 1890	100%	85%	15% high
Strophanthone 073,178	Tr. S. 1890	200%	120%	40% high
Strophanthone 073,178	Tr. S. 1890	155%	130%	16% high
Tr. Stroph. 774,382	Tr. S. 1890	135%	120%	11% high
Strophanthone 777,962	Tr. S. 1890	125%	110%	12% high
Strophanthone 076,234	Tr. S. 1890	90%	90%	
Tr. Stroph. 160,771	Tr. S. 1890	100%	110%	10% low
Strophanthone 076,234	Tr. S. 1890	120%	120%	
Tr. Stroph. 784,289	Tr. S. 1890	100%	100%	
Tr. Stroph. 784,777	Tr. S. 1890	114%	110%	4% high
Tr. Stroph. 134,288	Tr. S. 1890	143%	145%	
Tr. Stroph. 784,860	Tr. S. 1890	150%	155%	3% low
Strophanthin 179,932	Tr. S. 1890	144%	130%	10% high

In this second series eight tinctures, five purified aqueous preparations and one Kombe strophanthin were tested using the frog test standard tincture strophanthus U. S. P. 1890 diluted 1 to 70 as the color standard. The extremes ranged from 20% low to 40% high with an average error of 10%. If the two extremes are eliminated the average error is only 6.7%. The later results in this series are fairly satisfactory showing that in the case of strophanthus where total activity and alimentary absorbable activity are probably proportional though not equal and where a purification method is not necessary the color method can be used as a preliminary test. This result should be checked with a small number of frogs but the time and expense of an assay would be appreciably decreased without sacrificing accuracy.

As a further proof of the color method a series of preparations previously tested by each method were diluted and subjected to tests, the dilutions being unknown to the one making the tests. In most of these cases the frog method was not applied since its accuracy within a reasonable experimental error had been previously established.

TABLE III.

Preparation.	Standard.	Color test.	Actual.	Color error.
From Tr. 784,289	Tr. S. 1890	75%	67%	10% high
From 076,234	Tr. S. 1890	40%	31%	29% high
From Tr. 784,289	Tr. S. 1890	75%	80%	7% low
From Tr. 784,289	Tr. S. 1890	25%	29%	16% low
From Tr. 3 numbers	Tr. S. 1890	286%	293%	2% low
From Tr. 3 numbers	Tr. S. 1890	71%	64%	10% high
From Ouabain X	Ouabain	33%	31%	6% high
From Tr. U. S. P. 1890	Ouabain	26%	25%	4% high

The average variation in this series of eight unknowns is 10.5% while if the one aqueous preparation is eliminated the average variation is 8%. There was such a fair average agreement between the two methods in this series of unknowns and in the later tests of regular lots, it was decided that the colorimetric method

was satisfactory for use as a preliminary to a short final check of the activity of strophanthus preparations by the M. L. D. Frog Heart Method.

Trials were made on one lot of F. E. Squill, one of F. E. Convallaria and one of F. E. Veratrum Viride all of which can be tested by the M. L. D. Frog Method. The purified Veratrum Viride failed to develop any color with the alkaline picrate. The purified squill solution developed color very slowly and then not enough color in proportion to its physiological activity. The purified convallaria solution also failed to develop color in proportion to its physiological activity compared with digitalis.

SUMMARY.

1. Strophanthus preparations can be assayed in a preliminary way and with fair accuracy by the picric acid colorimetric method—the comparison with results by the frog method being reasonably satisfactory.

2. Either U. S. P. ouabain, 1 to 25,000 or tincture strophanthus U. S. P. X, 1 to 140 are quite suitable as standards.

3. Purification of solutions is not necessary and total activity is apparently always proportional though not equal to alimentary absorbable activity.

4. The colorimetric method is not suitable for the assay of squill, convallaria and veratrum preparations as judged by one attempt on each.

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STABILITY OF TENTH NORMAL POTASSIUM DICHROMATE VOLUMETRIC SOLUTION.

BY M. W. CAREY.

"I found an old bottle of Potassium Dichromate tenth normal V. S. recently in our laboratory stock which had been made and standardized in 1903. At that time it had a factor of 1.004.

"Since the solution appeared to be in good condition I refactored it and found rather to my surprise that there had been no appreciable change in strength. The factor as I find it now is 1.001.

"The solution had been kept during the past 23 years in an 8-liter, flint glass bottle with an ordinary cork stopper—the bottle about two-thirds full. In color and clarity it appears like a freshly-made solution, on agitation, however, a slight sediment was disclosed in the bottom of the bottle.

"It is surprising that a solution of this kind should keep so well."

ANALYTICAL LABORATORIES,
E. R. SQUIBB AND SONS.

PERMANENT STANDARDS FOR THE DETERMINATION OF HYDROGEN-ION CONCENTRATION.

BY ABRAHAM TAUB.

The advantages claimed for the colorimetric over the electrometric method of p_H determination are simplicity and rapidity of manipulation. This, however, is true only if all the buffer and indicator solutions are at hand: but the difficulty lies in the fact that these solutions are unstable, some deteriorating within three weeks. They take rather considerable time to prepare properly; the NaOH solution is especially difficult to prepare, and must be stored in paraffin-lined bottles. For accurate work these solutions should be checked against the hydrogen electrode. Various methods have therefore been devised for obtaining permanent sets of standards for the different indicators. But the majority of these are merely relatively permanent.

The standards which are found on the market to-day as part of p_H testing sets or comparators consist of buffer solutions containing the various indicators and kept in sealed ampoules under sterile conditions. They are guaranteed by the manufacturers for not more than six months, as the indicator dyes slowly fade in these solutions. In fact, color standards below p_H 3.0 are not included in these sets since they deteriorate in a very short time.

Haskins (1) has prepared standards which he claims do not fade for nine months. They are made with amaranth and paranitrophenol, dyes which are but slightly affected by the buffers in which they are placed. His range of standards, however, is limited to p_H 4.5–7.5, corresponding to colors produced by methyl red, rosolic acid and neutral red. Another disadvantage of his standards is that they are prepared in uneven increments, varying from 0.1 to 0.45 p_H.

Clark (2) has prepared a color chart for eight of his indicators, but due to inherent differences in printed colors and colored solutions, only rough comparisons can be made. It is in fact merely intended as an aid in establishing a color memory.

Gillespie (3) has devised a drop-ratio method for two-color indicators based upon a dissociation curve and not involving the use of buffers. His standards, however, are not permanent for more than three months.

Michaelis, Gyemant and Krüger (4) have a somewhat similar method for one-color indicators. Since, however, their alkaline solutions are unstable, Windisch (5), and later Kolthoff (6) have used potassium chromate and dichromate as comparison solutions. Although these solutions are permanent, the method itself has never found favor in routine testing since it is open to serious error in the hands of workers who are not thoroughly familiar with the theory involved.

A device based upon the principles of Gillespie's method is the double wedge colorimeter of Bjerrum (7), later improved by Kolthoff (8). This consists of two transparent wedges cemented together with Canada balsam, one filled with the fully transformed indicator in alkaline solution, the other with the indicator in acid solution. By means of a screen, lamp and scale the entire transitional range of the indicator may be compared with the solution to be tested. The alkaline solution, however, fades after a few months.

The method which has been almost universally adopted because of its simplicity is that in which a suitable indicator of definite concentration is added to a

specific volume of the solution under examination, and the color obtained is directly compared with a series of standards. It is with this method that the author was primarily concerned in the search for permanent standards.

Thus far there have been but two types of permanent standards used—colored glasses, and stable inorganic salt solutions. Sondén (9) was among the first to use colored glasses for p_H standards. In 1924, Badollet, Hamilton and Walton, Jr. (10) patented a method for obtaining permanent colors in glass. There are, however, two disadvantages in the use of glass standards—one is the difficulty of standardization; the other is the error involved in light absorption, due to the difference in thickness and in the nature of the material in glass and solutions.

Kolthoff (11) has prepared blends of ferric chloride and cobalt nitrate solutions, matching the colors produced by neutral red, methyl orange, methyl red and tropeolin OO. He has not, however, attempted to prepare a complete set of standards, leaving gaps between p_H 4.5–5.2 and 5.8–7.0. His increments are rather uneven, varying from 0.02 to 0.3 p_H.

It was the author's desire to secure a complete set of standards for the Clark and Lubs' indicators since these are so widely used. The difficulty lay in obtaining inorganic salt solutions which could be blended to obtain the deep reds and blues of the brilliant sulphonphthalein indicators. However, by using small amounts of the indicator solutions, a sufficient number of hues were matched to obtain a complete series of standards for the range 1.2–9.0 p_H, allowing for a convenient degree of overlapping.

The standard solutions used were the Arny (12) "Co-Fe-Cu" fluids. These consist of three solutions which can easily be standardized volumetrically: a $N/2$ cobalt chloride, containing 59.497 Gm. $CoCl_2.6H_2O$ per liter of 1% HCl; a $N/2$ ferric chloride, containing 45.054 Gm. $FeCl_3.6H_2O$ per liter of 1% HCl; and a $N/2$ cupric chloride, containing 42.630 Gm. $CuCl_2.2H_2O$ per liter of 1% HCl. In connection with the copper solution it might be added that the original solution was a $N/2$ copper sulphate, but in order to have all the anions alike, the copper chloride was substituted. Fortunately, the color values of the $N/2$ chloride and sulphate solutions are identical, so that this change in the standard solutions has no effect upon our color researches of the past.

As to permanency, these solutions have been found to stand up without change for more than ten years. The HCl in the concentration present, about $N/4$, acts as a preservative, but has no effect upon the color value of the three solutions. A separate investigation has shown that concentrations of HCl up to $N/2$ may be used. Above this concentration the colors change in shade and intensity.

In selecting the indicators, those recommended in the International Critical Tables (13), (1926) were adopted with a few exceptions. Bromcresol purple and bromphenol blue were not used because of their marked dichroic effects (*viz.*, their property of exhibiting different colors in different light, due to the difference in the quantity and intensity of the light absorbed). The bromphenol blue range was covered by methyl orange, and the bromcresol purple range by chlorphenol red.

In preparing the indicator solutions some workers prefer alcoholic solutions and others aqueous solutions in which the acidity of the dye has been exactly neutralized. The advantage of alcohol is of course protection against mold

growth and ease and rapidity of solution, but the use of unneutralized dye may cause serious error in the determination of p_H in non-buffered solutions. In some cases the alcohol may cause precipitation of material in solution.

The only disadvantage of the neutralized aqueous indicator is its tendency toward mold formation. The author has been able to avoid this by using a 20% alcoholic solution of the dye to which enough standard alkali has been added for neutralization. As but 0.2–0.5 cc. of this indicator solution is used in the p_H determination, the slight amount of alcohol has practically no effect upon the solution examined.

As to the concentration of indicator used, there seems to be no uniformity, most workers using both different percentages of dye and different amounts of indicator solution. With a view toward standardization, the 0.04% strength directed in the International Critical Tables (14) was adopted, the amount used in each case being dependent upon the color intensity of the indicator.

All of the indicators used were two-colored. Their advantage is that there is a change of shade with every shift in p_H, while in the one-colored indicator a change in p_H is accompanied by a change in intensity of the color. The advantage is obvious when one considers that a worker is using his own indicator solution, but basing his comparisons upon standards worked out by someone else. A slight difference in the dyestuff, concentration of dye, or in the amount used, which is very probable when but 0.2 to 0.5 cc. is employed, will not have any material effect upon the shade of a two-color indicator, but will have a decided effect upon the intensity of a one-color indicator.

In the following table is listed the amount of standard alkali used for neutralizing the acidity of the dye. A 0.04% solution is used throughout. 0.1 Gm. of the dye is dissolved in 52 cc. of neutral alcohol (95%), the designated amount of alkali added, and the solution made up to 250 cc. with distilled water. It is advisable to distil both the alcohol and the water over barium hydroxide.

TABLE I.

Indicator.	Cc. of $N/100$ NaOH.
Metacresol Purple (acid and alkaline range)	26.5
Thymol Blue (acid and alkaline range)	21.5
Methyl Orange (sodium salt of helianthin)	....
Bromcresol Green	14.5
Methyl Red	37.0
Chlorphenol Red	23.5
Bromothymol Blue	16.0
Phenol Red	28.5
Cresol Red	26.3

In the following tables, Lovibond values of both the buffer standards and corresponding "Co-Fe-Cu" blends are given for comparison. In some cases slight differences in color matches will be noted. This is due to the fact that the Lovibond determinations were made by reflected light while the actual comparisons of buffer standards and blends were made by direct light, which is the usual method employed for colorimetric p_H determinations

The Lovibond glasses were of the following series: Yellow—No. 510; Blue—No. 1180; Red—No. 200. All readings were made in $^1/_2$-inch glass cells, by clear northern daylight.

The "Co-Fe-Cu" standard blends may be preserved in colorless 1/2-ounce g. s. french square bottles. These may be procured of even dimensions, and the solution to be tested may be directly matched against the standards in these bottles.

In all cases the specified amount of indicator solution is added to 10 cc. of the solution under test. Comparisons are made at 20° C.

TABLE II.—METACRESOL PURPLE (*m*-CRESOLSULPHONPHTHALEIN) (ACID RANGE).

Use 0.3-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
1.2	8.4	0.4	...	*9.0*	...	*1.0*	...	8.3	0.6	...
1.4	6.4	0.7	...	*6.5*	*0.1*	...	*3.4*	6.4	0.8	...
1.6	5.6	1.2	...	*5.5*	*0.2*	...	*4.3*	5.6	1.3	...
1.8	4.7	1.7	...	*4.4*	*0.5*	...	*5.1*	4.8	1.7	...
2.0	4.2	2.3	...	*4.1*	*1.3*	...	*4.6*	4.3	2.4	...
2.2	3.2	3.0	...	*2.8*	*2.1*	...	*5.1*	3.3	3.0	...
2.4	2.7	3.5	...	*2.3*	*2.7*	...	*5.0*	2.7	3.6	...
2.6	2.1	4.0	...	*1.7*	*3.3*	...	*5.0*	2.0	4.0	...

TABLE III.—THYMOL BLUE (THYMOLSULPHONPHTHALEIN) (ACID RANGE).

Use 0.5-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
1.6	5.3	0.4	...	*5.3*	...	...	*4.7*	5.3	0.4	...
1.8	4.4	1.2	...	*3.9*	*0.3*	...	*5.8*	4.4	1.2	...
2.0	3.7	1.6	...	*3.2*	*0.8*	...	*6.0*	3.8	1.6	...
2.2	2.3	2.4	...	*2.2*	*1.8*	...	*6.0*	2.2	2.5	...
2.4	2.1	2.8	...	*1.9*	*2.2*	...	*5.9*	2.1	2.8	...
2.6	1.9	3.4	...	*1.6*	*2.7*	...	*5.7*	1.9	3.3	...
2.8	1.6	3.6	...	*1.3*	*3.0*	...	*5.7*	1.5	3.5	...

Standard for p_H 1.2–1.4 were too deep red to be matched.

TABLE IV.—METHYL ORANGE (SODIUM *p*-BENZENESULPHONATE-AZO-DIMETHYLANILINE).

Use 0.3-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
3.0	8.4	2.5	...	*8.1*	*0.3*	...	*1.6*	8.4	2.4	...
3.2	8.0	3.2	...	*7.5*	*0.6*	...	*1.9*	8.0	3.2	...
3.4	6.6	4.4	...	*6.5*	*1.0*	...	*2.5*	6.6	4.3	...
3.6	5.8	5.4	...	*5.8*	*1.9*	...	*2.3*	5.7	5.3	...
3.8	5.0	6.8	...	*4.8*	*2.9*	...	*2.3*	5.0	6.8	...
4.0	4.4	7.2	...	*4.0*	*4.0*	...	*2.0*	4.5	7.2	...
4.2	4.1	7.8	...	*3.4*	*5.0*	...	*1.6*	4.1	7.9	...
4.4	3.4	8.2	...	*2.8*	*5.8*	...	*1.4*	3.3	8.2	...

Although not one of the Clark and Lubs' indicators, methyl orange was included, because of its freedom from dichromatism, in place of bromophenol blue. It is recommended by Kolthoff (15) as a useful indicator, having but a slight salt error.

TABLE V.—BROMCRESOL GREEN (TETRABROM-*m*-CRESOLSULPHONPHTHALEIN).

Use 0.3-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
3.8	0.2	2.0	0.1	*0.3*	*2.2*	*0.5*	*7.0*	0.2	1.9	0.1
4.0	0.2	1.9	0.5	*0.6*	*1.8*	*1.8*	*5.8*	0.2	1.9	0.5

TABLE V.—*Continued.*

4.2	0.2	1.9	1.0	*0.7*	*1.6*	*3.0*	*4.7*	0.2	2.0	0.9
4.4	0.2	1.8	1.9	*0.9*	*0.8*	*5.1*	*3.2*	0.2	1.8	1.9
4.6	0.2	1.6	2.3	*1.1*	*0.5*	*7.0*	*1.4*	0.2	1.6	2.3
4.8	0.1	1.6	3.4	*0.9*	*0.3*	*8.8*	...	0.1	1.7	3.4
5.0	...	1.5	3.7	*0.5*	*0.2*	*9.3*	...	...	1.5	3.6

This is one of the comparatively recent dyes synthesized by Cohen (16); it is particularly free from dichromatism. Kolthoff (17) prefers to call it bromcresol blue since the name usually applied is that of the extreme alkaline color.

The standards for p_H 5.2–5.6 were too deep blue to be matched.

TABLE VI.—METHYL RED (*o*-CARBOXYBENZENE-AZO-DIMETHYLANILINE).

Use 0.2-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
4.8	9.6	0.6	...	*9.8*	...	*0.2*	...	9.6	0.8	...
5.0	6.3	1.6	...	*5.9*	*0.3*	...	*3.8*	6.4	1.6	...
5.2	5.4	2.0	...	*5.0*	*0.7*	...	*4.3*	5.5	2.1	...
5.4	4.2	3.7	...	*3.7*	*2.3*	...	*4.0*	4.3	3.8	...
5.6	3.3	4.0	...	*2.9*	*2.8*	...	*4.3*	3.4	4.0	...
5.8	2.1	5.2	...	*1.9*	*4.0*	...	*4.1*	2.0	5.2	...
6.0	1.5	5.7	...	*1.4*	*5.3*	...	*3.3*	1.5	5.6	...

Although this indicator fades and is being replaced by chlorphenol red and bromcresol green, it was included since it is still used in many biological laboratories. Most workers prefer a straight alcohol solution of the dye because of the extreme difficulty of making an aqueous solution. By following the directions for preparing indicator solutions given above no such difficulty is encountered, and a neutralized indicator is obtained which gives more accurate results in non-buffered solutions.

Standards for p_H 4.4–4.6 were too deep red to be matched.

TABLE VII.—CHLORPHENOL RED (DICHLOROPHENOLSULPHONPHTHALEIN).

Use 0.5-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
5.0	0.8	3.4	...	*0.8*	*3.8*	...	*5.4*	0.8	3.4	...
5.2	1.0	2.9	...	*0.9*	*3.3*	...	*5.8*	1.0	2.9	...
5.4	1.2	2.4	...	*1.1*	*2.4*	...	*6.5*	1.2	2.4	...
5.6	1.6	1.9	...	*1.4*	*1.9*	...	*6.7*	1.6	1.9	...
5.8	1.8	0.9	...	*1.8*	*1.0*	*0.1*	*7.1*	1.9	1.0	...
6.0	2.1	0.4	0.1	*2.1*	*0.2*	*0.4*	*7.3*	2.1	4.2	0.1
6.2	4.2	0.2	1.0	*5.0*	...	*5.0*	...	4.2	0.3	1.0

Standards for p_H 6.4–6.6 were too deep red to be matched.

TABLE VIII.—BROMTHYMOL BLUE (DIBROMTHYMOLSULPHONPHTHALEIN).

Use 0.3-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
6.0	0.2	1.7	0.1	*0.2*	*3.1*	*0.3*	*6.4*	0.2	1.8	0.1
6.2	0.2	1.8	0.6	*0.3*	*2.7*	*1.0*	*6.0*	0.2	1.9	0.6
6.4	0.2	1.7	1.1	*0.3*	*2.1*	*1.8*	*5.8*	0.2	1.9	1.1
6.6	0.2	1.8	1.5	*0.3*	*1.7*	*2.6*	*5.4*	0.2	1.9	1.5
6.8	0.2	1.6	2.2	*0.4*	*0.7*	*4.4*	*4.5*	0.2	1.6	2.2
7.0	0.2	1.6	3.5	*0.8*	*0.3*	*8.9*	...	0.2	1.7	3.4
7.2	0.2	1.3	3.7	*0.7*	*0.1*	*9.2*	...	0.2	1.5	3.7

Standards for p_H 7.4–7.6 were too deep blue to be matched.

TABLE IX.—PHENOL RED (PHENOLSULPHONPHTHALEIN).

Use 0.3-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
6.6	1.8	6.8	...	*1.8*	*6.5*	...	*1.7*	1.8	6.9	...
6.8	2.3	6.5	...	*2.4*	*5.4*	...	*2.2*	2.3	6.7	...
7.0	4.1	5.0	...	*3.5*	*2.9*	...	*3.6*	4.2	5.1	...
7.2	5.4	3.1	...	*5.0*	*1.3*	...	*3.7*	5.4	3.3	...
7.4	7.2	1.6	...	*7.2*	*0.3*	...	*2.5*	7.2	1.6	...

Standards for p_H 7.6–8.2 were too deep red to be matched.

TABLE X.—CRESOL RED (*o*-CRESOLSULPHONPHTHALEIN).

Use 0.2-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
7.2	1.3	2.2	...	*1.0*	*2.8*	...	*6.2*	1.2	2.2	...
7.4	1.7	2.0	...	*1.4*	*2.2*	...	*6.4*	1.7	2.1	...
7.6	2.0	1.3	0.2	*2.1*	*1.2*	*0.7*	*6.0*	2.0	1.5	0.2
7.8	3.1	0.5	0.4	*3.0*	*0.1*	*1.7*	*5.2*	3.1	0.5	0.4
8.0	4.0	0.4	0.8	*4.6*	...	*3.7*	*1.7*	4.0	0.5	0.8
8.2	5.0	0.2	1.6	*5.6*	...	*4.4*	...	4.9	0.4	1.5

Standards for p_H 8.4–8.8 were too deep red-violet to be matched.

TABLE XI.—METACRESOL PURPLE (ALKALINE RANGE).

Use 0.2-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
7.6	1.2	1.8	0.4	*1.3*	*1.5*	*1.2*	*6.0*	1.2	1.8	0.4
7.8	1.1	1.3	0.4	*1.2*	*1.0*	*1.1*	*6.7*	1.2	1.3	0.6
8.0	1.3	0.8	0.7	*1.5*	*0.4*	*2.0*	*6.1*	1.3	0.8	0.6
8.2	1.5	0.4	0.8	*1.8*	*0.1*	*2.4*	*5.7*	1.5	0.4	0.8
8.4	1.9	0.2	1.2	*2.5*	...	*4.0*	*3.5*	1.9	0.2	1.2
8.6	3.0	0.2	1.9	*3.5*	...	*6.5*	...	3.0	0.4	1.9

Standards for p_H 8.8–9.2 were too deep purple to be matched.

TABLE XII.—THYMOL BLUE (ALKALINE RANGE).

Use 0.4-cc. indicator.

	Lovibond readings of buffer standards.			Matching blends (cc.).				Lovibond readings of blends.		
p_H.	R.	Y.	B.	Co.	Fe.	Cu.	H_2O.	R.	Y.	B.
8.2	0.2	1.5	0.4	*0.6*	*1.8*	*1.2*	*6.4*	0.2	1.5	0.4
8.4	0.2	1.2	0.7	*0.8*	*1.2*	*2.3*	*5.7*	0.2	1.2	0.7
8.6	0.2	0.8	1.4	*1.0*	*0.4*	*4.8*	*3.8*	0.2	0.9	1.5
8.8	0.2	0.4	2.2	*1.4*	*0.1*	*7.0*	*1.5*	0.2	0.5	2.2
9.0	0.2	0.2	3.2	*1.5*	...	*8.5*	...	0.2	0.4	3.0

Standards for p_H 9.2–9.6 were too deep blue to be matched.

All of these standards consume comparatively little time for preparation; they can easily be made in a day, after which they last indefinitely. They are not subject to the limitations of the usual buffer standards, such as fading and mold growth, and are not affected by light, temperature or CO_2 absorption.

Methods involving permanent standards are not intended to replace more accurate colorimetric or electrometric determinations. They are approximate methods, but of a sufficient degree of accuracy for usual routine work. The

standards in this paper have a limit of accuracy of about 0.1 p_H with the exception of a few cases where the error approaches 0.2 p_H.

The usual salt and protein errors should of course be taken into consideration; a full discussion of these can be found in the works of Clark, Kolthoff, Prideaux and Michaelis.

SUMMARY.

1. Seventy-three permanent standards, made by blending the "Co-Fe-Cu" inorganic salt solutions have been prepared, covering a p_H range of 1.2–9.0. Lovibond comparative readings have been made for these and the corresponding standard buffer solutions. These standards are notable for their stability and ease of preparation.

2. The indicators chosen were those found reliable and least subject to salt errors. By use of 20% neutralized alcoholic solutions, the indicators themselves are made to stand up for quite a period of time without decomposition, and may be used in unbuffered as well as buffered solutions.

3. Further studies are being made on other suitable indicators, especially in the p_H range 9.0–14.0.

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COLUMBIA UNIVERSITY,
COLLEGE OF PHARMACY,
DEPT. OF CHEMISTRY,
August, 1926.

Dr. Edgar Fahs Smith has recently reprinted an article by him on "Fragments Relating to the History of Chemistry in America." In this he has a reproduction of the title page of "A New Nomenclature on Chemistry," prepared by Dr. Lyman Spalding, "Father of the U. S. P.," and also a cut of him taken from the "Life of Dr. Lyman Spalding," published by his grandson. The physicians and pharmacists, as well as chemists, should see that Dr. Lyman Spalding is honored with a place in the Hall of Fame at the next election.

A SURVEY OF CHEMOTHERAPEUTIC RESEARCHES IN PROGRESS IN THE UNITED STATES, AND THE PROMOTION OF COÖPERATION BETWEEN ORGANIC CHEMISTS AND PHARMACOLOGISTS.

BY MARSTON TAYLOR BOGERT.*

In an endeavor to bring about more frequent and more intimate coöperation between organic chemists and pharmacologists, the following letter, accompanied by a suitable questionnaire sheet, was mailed to 793 scientists thought likely to be interested:

NATIONAL RESEARCH COUNCIL.

Division of Chemistry and Chemical Technology, Committee on Chemical Research on Medicinal Substances.

COÖPERATION BETWEEN CHEMISTS AND PHARMACOLOGISTS.

With the steady progress of scientific investigation, the rôle of the fundamental science of chemistry in the service of the healing art becomes increasingly important and fascinating, and the time seems opportune to endeavor to bring about closer and more frequent coöperation between our chemists and our pharmacologists, in the belief that this will lead to the discovery of products of sufficient therapeutic promise to justify their further testing by clinicians and that thus some real contribution will be made to the alleviation of human suffering and the cure of the sick.

In our own country it happens frequently to-day that chemists who have prepared new compounds possessing therapeutic possibilities know not where to turn in order to have such products tested pharmacologically and, similarly, pharmacologists who have become interested in the physiological effects of a certain group of compounds have difficulty in finding a chemist willing and able to prepare for them the substances desired. This kind of coöperation has been far commoner in Europe than here and is one of the reasons why so many valuable modern remedies are of European origin.

Our Committee of the National Research Council will feel that it is performing a useful and patriotic service if it can function as a sort of clearing house to bring together these two groups of workers. The Committee has no thought of attempting to direct or interfere in any way with the research work of any one, but will endeavor to aid by supplying information likely to be of value and which the recipient can utilize as he thinks best. There is much of inspiration to be derived from the knowledge that our investigations are being watched with deep interest by others.

The purpose of the enclosed questionnaire, therefore, is threefold:

1. To secure a list of chemists and pharmacologists pursuing investigations in these fields, with the record of the researches they have under way.

2. To ascertain which of these investigators are interested in the type of coöperation proposed.

3. To learn what institutions have special facilities to offer in these fields, so that prospective students and research workers may be informed.

It is suggested that those coöperating in these investigations agree that if any of their products proves to be a useful drug, it shall be placed on the market under conditions which are acceptable to the Council of Pharmacy and Chemistry of the American Medical Association for inclusion in their list of new and non-official remedies. This will not prevent the patenting of the product, should the investigator so desire, but will require that the substance shall be given a trade name which indicates its true chemical nature, that the structural formula shall be given if known, that the literature used in circulating the remedy shall not contain any false, fraudulent or exaggerated claims as to its efficacy, and that the substance shall be sold only through the medium of reputable physicians and not marketed directly to the public.

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* Chairman, Committee on Chemical Research on Medicinal Substances, Division of Chemistry and Chemical Technology, National Research Council.

If you believe that what we are trying to accomplish is really worth while, and that our Committee of the National Research Council is an appropriate body to undertake it, we hope that you will be good enough to assist us by supplying the information requested on the accompanying sheet.

MARSTON TAYLOR BOGERT, *Chairman.*

The replies to this appeal have been most encouraging and we now have records of over 300 scientists who are either already engaged in coöperation of the kind mentioned or are willing to engage in it. Even in the case of many not yet in a position to participate, we have received most cordial endorsement of the undertaking and expressions of their desire to coöperate whenever the opportunity occurs.

The information thus accumulated is enabling us to bring into mutually advantageous contact fellow workers in the same or closely related fields, and we believe that in thus functioning as a sort of clearing house for information of this kind we are performing a useful service. I will cite but a few illustrations of how this operates practically. Three communications recently passed through my hands within a few days of one another. Two of these were from distinguished medical men, one in the South and the other in the West. One of these gentlemen was interested in a certain group of dyestuffs in the treatment of diseases affecting the human kidneys; the other happened to be interested in the same group of dyestuffs for combating infections in the gall bladder; while the third communition was a manuscript from certain of our organic colleagues reporting investigations in this same group of dyes. The way was thus opened to apprise each of these gentlemen of the fact that the others were interested in the same field and the particular direction in which their investigations were proceeding. In another instance, two scientists who had begun the compilation of bibliographies covering the same ground, each ignorant of the other's undertaking, were brought together and a coöperative effort replaced what would otherwise have been duplication. Every week opportunities occur for service of this character, and they are likely to increase with the rapidly growing interest in this vitally important field of research, if we can maintain an efficient organization for handling the business. What such a central office can accomplish will be determined chiefly by the extent of the financial support accorded the undertaking. During the past year, the only aid received has been that from the National Research Council who supplied the necessary stationery and postage. It is obvious that the work cannot be continued unless provision is made at least for clerical assistance.

The researches reported are arranged alphabetically below and will suffice to give a conspectus of present activities in the study of medicinal products along chemical and pharmacological lines. It is appreciated that the record is incomplete but, so far as the writer knows, it is the only attempt which has been made within recent years to gather and classify information of this kind, and may be regarded as representing the situation on or about July 1, 1926.

The list is as follows:

1. Acetanilide with reference to its cardiac effects.
2. Acetophenones, amino derivatives, as drugs for raising blood pressure.
3. Acetylsalicylic acid (Aspirin).
4. Acids, organic, from toxic plants of the Rocky Mountain region.

5. Aconite and its bio-assay.

6. Acridines, especially those related to Proflavine, Acriflavine, Rivanol, etc.

7. Adrenaline (Adrenine or Suprarenine), its bio-assay and derivatives.

8. Alcohols, including those optically active and those containing the $-CCl_3$ group.

9. Alimentary functions, drugs influencing it.

10. Alkaloids, of aconite, death camas, lupine, larkspurs, veratrum, of the Rocky Mountain region, and the relation of the physiological effect of alkaloids to acid-base equilibrium and to other physico-chemical properties.

11. Amines and their derivatives, amines containing sulfur, amine oxides, sympathomimetic amines and their action on the circulation.

12. Anemia, experimental anemia and its treatment, synthetic drugs for anemia, the use of dyes in the treatment of pernicious anemia.

13. Anesthetics, general; including acetylene and ethylene, and the synthesis of new ones.

14. Anesthetics, local; benzyl compounds, derivatives of *p*-hydroxymethyl benzoic acid, the synthesis of new types.

15. Anthraquinone derivatives as substitutes for natural cathartics, chemical composition of natural anthraquinone drugs and their evaluation.

16. Antibodies, their purification in immune sera, pneumonia antibody solutions, protein-free diphtheria antitoxin.

17. Antimonials, organic antimonials, including antimonyl tartrates and antimony derivatives of gallic acid.

18. Antiseptics, Disinfectants and Germicides; their standardization, relation of their physiological effect to acid-base equilibrium and to other physico-chemical constants, intestinal antiseptics, urinary antiseptics, phenolic antiseptics (including derivatives of resorcinol, syringic acid, etc.), antiseptic dyes, chlorine and hypochlorite antiseptics (chloramines, etc.), and mercurial antiseptics.

19. Antispasmodics, especially the benzyl derivatives.

20. Antisyphilitics (Antiluetics), the synthesis and pharmacological examination of new ones.

21. Arecoline, its synthesis and the synthesis of satisfactory substitutes.

22. Arsenicals, organic, acyclic and cyclic, for syphilis, neurosyphilis and trypanosomiasis, arsonic acids and arseno compounds, arsphenamine (Salvarsan) types, arsino diacetone glucose, arsenic derivatives of thiazoles and of selenazoles.

23. Arthritis, chronic, synthetic remedies.

24. Autonomic and muscular drugs, their action on the cold-blooded heart.

25. Azo dyes, especially those prepared with H acid, for use as drugs.

26. Bacteria, the chemistry of specific substances of bacterial origin, the neutralization of bacterial toxins, chemical investigation of tubercle bacilli.

27. Barbituric acid and derivatives, including barbitals (veronals) and phenobarbitals (luminals).

28. Benzaldehyde.

29. Benzoic acid and benzoates.

30. Bismuth, organic derivatives.

31. Bitter principles, especially the castelamarin of Castela nicholsoni, Hooker.

32. Blood, influence of drugs upon the volume of its flow, drugs for causing its coagulation and for raising or lowering its pressure.

33. Bromides.

34. Caffeine and its citrate, their cardiac effects.

35. Calomel, its pharmacology.

36. Camphor and its derivatives.

37. Camphoric acid and its esters.

38. Cannabis and its bio-assay.

39. Carbon tetrachloride and its pharmacology.

40. Cardiac effects and drugs, including electrocardiographic methods for cardiac and circulatory drugs, and heart tonics.

41. Carvacrol and its derivatives.

42. Cascara, its chemical standardization, and the connection between chemical constitution and physiological effects in the case of cascara and of related drugs.

43. Cathartics, their standardization, connection between cathartic action and fineness of subdivision, phenolphthalein cathartics.

44. Cevadine.

45. Chaulmoogric and Hydnocarpic acids, their synthesis and study, including homologs, derivatives and related compounds, chaulmoogra oil.

46. Chelidonine.

47. Chenopodium, especially western oils.

48. Chloramines, organic.

49. Cicuta occidentalis as a toxic agent.

50. Cinchonas.

51. Cinchophens (atophans), including quinazoline, thiazole and selenazole types, and arsenic derivatives.

52. Circulation, effect of aromatic amines and other drugs upon same.

53. Citrus products, citric acid and citrates.

54. Cocaine and the cocaine-tyramine antagonism.

55. Cod-liver oil, its chemical and pharmacological examination, and the isolation of its active principles.

56. Colloids and their rôle in pharmacology.

57. Colorimetric methods and standards for pharmaceuticals.

58. Datura stramonium.

59. Dehydration and dehydrogenation, by catalytic methods, for the preparation of synthetic drugs.

60. Delirifacients.

61. Diabetes, synthetic remedies, odd-carbon fatty acids (Intarvin) for diabetics.

62. Diamines and their use as hair-dyes.

63. Digitalis, its chemical, colorimetric and bio-assay, its leaves, stems and seeds, Kansas digitalis.

64. Diphenic acids.

65. Dyes, synthetic; as pharmaceuticals, fluorescent dyes, antiseptic dyes, mercury derivatives of dyes, azo dyes, triphenylmethane dyes, thiazole dyes, phthalein dyes, acridine dyes, the selective bacteriostatic properties of dyes, use of dyes in pernicious anemia, relation of colloidal state of dyes to inflammatory exudates and blood, excretion of dyes by the kidneys, food colors.

66. Edema and drugs for its prevention.

67. Embalming agents and their effects upon the determination of alkaloids and other toxic agents.

68. Emetin.

69. Emulsions, effects of ions and of alkaloids.

70. Endocrine secretions.

71. Enzymes of animals, yeasts, pepsin and its assay, trypsin, physico-chemical investigation of enzymes.

72. Epilepsy, drugs for its treatment.

73. Ergot and its bio-assay.

74. Essential oils, the therapeutic efficiency of natural and synthetic volatile oils upon pathogenic fungi.

75. Esters and their pharmacological investigation.

76. Ether and its pharmacological investigation.

77. Fluorenone carboxylic acid derivatives.

78. Fluorides, inorganic and organic.

79. Gallic acid and derivatives.

80. Gaultheria Shallon.

81. Genito-urinary infections and drugs for their treatment.

82. Germanium derivatives, especially the dioxide and sodium germanate.

83. Glandular products, animal glands of all kinds, ovarian products, extracts of corpus luteum, follicular fluid.

84. Glucosides, of the Rocky Mountain region, of Triglochina maritima, the castelin of Castela Nicholsoni, Hooker.

85. Gold, organic derivatives for the treatment of protozoal infections.

86. Guanidines, acyclic and cyclic.

87. Hormones, ovarian, follicular, suprarenal, of the thyroid, parathyroid, liver (heparmone), spleen, testicles, action of hormones on urogenital system.

88. Hydrazines, organic, and their study in connection with the production of anemia or of red cell regeneration.

89. Hydrocarbons and their use as general anesthetics, especially methylene, ethylene and propylene.

90. Hyoscyamus.

91. Hypnotics (soporifics), urethane types, barbituric acid derivatives.

92. Hypochlorites, of high test, for use as antiseptics.

93. Insulin, its chemical examination and purification, use of electrophoresis in its purification, its pharmacology and therapy.

94. Iodine and iodides, effects upon nitrogen metabolism, iodamines as antiseptics, iodotoluidines.

95. Ipecac, its preparations and alkaloids.

96. Irritants, their chemical and pharmacological study.

97. Ketones, for use in medicine.

98. Lachrymators.

99. Lactic acids.

100. Lead, organic derivatives, especially lead tetraethyl.

101. Licorice; glycyrrhizin and other licorice products.

102. Liver, its hormones, liver extract, drugs acting upon the liver, substances in the liver which reduce blood pressure.

103. Logwood; hematoxylin and other logwood products as staining media.

104. Magnesium, organic derivatives, Grignard reactions in drug syntheses.

105. Malonic acid and ethylidene malonic esters.

106. Membrane potentials and their study with reference to the preferential osmotic effects exhibited by certain animal tissues.

107. Mercurials, organic mercury derivatives of dyes, of naphthalene and naphthoic acids, of substituted benzoic acids, mercurials for the treatment of syphilis, neurosyphilis and trypanosomiasis, excretion of mercury, micro-analytical methods for the determination of mercury in organic compounds.

108. Metabolism; drugs affecting human or animal metabolism in such manner that the effects can be estimated by the changes in the chemical composition of the blood, urine, body fluids or tissues; carbohydrate and fat metabolism and adjuvants thereto; drugs influencing total or nitrogen metabolism.

109. Metals, pharmaceuticals containing the heavy metals.

110. Micro-analysis, ultra balances and Pregl methods.

111. Molecules, their size and shape with reference to their physiological effects.

112. Mountain Ash berries.

113. Mustard Gas.

114. Mustard Oils.

115. Mydriatics and their bio-assay.

116. Naphthylamines as antispasmodics and blood pressors.

117. Narcotics.

118. Onium compounds, connection between their structure and physiological effects.

119. Optical isomers, optically active alcohols and drugs, resolution of racemic forms and physiological properties of optical isomers.

120. Drugs indigenous to the Pacific coast.

121. Pectin.

122. Peristalsis and drugs which influence it

123. Petroleum, medicinals obtainable therefrom.
124. Phenanthridones.
125. Phenols, substituted phenols, phenolic compounds from Rocky Mountain poisonous plants, from the woody aster and other plants, *n*-hexyl resorcinol (Caprokol) and related compounds, phenolic analogy of Position 3 in the glucose molecule, connection between constitution, physiological and bactericidal action.
126. Phenoxyacetic acid and derivatives.
127. Phthaleins, simple and substituted, their chemistry and pharmacology.
128. Piperidine and its methyl derivatives.
129. Pituitary liquor and its bio-assay, aqueous extracts of posterior lobe of cattle pituitary.
130. Podophyllum.
131. Pressor drugs, including amines, and the pressor principle of Capsella bursa pastoris.
132. Pyridine carboxylic acids and their amino esters.
133. Pyrrole derivatives and their function in the production of anemia or of red cell regeneration.
134. Quinazoline drugs.
135. Quinidine and its derivatives, and the cardiac action of quinidine sulfate.
136. Quinine and its derivatives, and the cardiac action of quinine.
137. Quinoline, hydroxyquinolines as antiseptics, amino ester of quinoline carboxylic acids.
138. Renal function and drugs affecting it.
139. Respiration and drugs affecting it.
140. Salicylic acid and derivatives.
141. Scopolamine.
142. Secretagogues, especially gastrin and secretin.
143. Selenium, organic derivatives, selenazoles, arsenic selenium organic compounds.
144. Septicemia and new synthetics for its treatment.
145. Silicotungstic acid as an alkaloidal reagent.
146. Solvents; new solvents for the extraction and purification of drugs.
147. Squill and its bio-assay.
148. Strophanthus, its chemistry and bio-assay, chemical study of strophanthin.
149. Styptics.
150. Sulfur compounds; aromatic sulfur compounds, thiotoluidines related to "Intramin," thiazoles; pharmacology of sulfur, sulfur dioxide and sulfites.
151. Terpenes and terpene derivatives.
152. Thioureas.
153. Thymol and derivatives.
154. Thyroxin and related compounds.
155. Tin, organic derivatives.
156. Toxics, from plants or animals.
157. Urea and derivatives.
158. Veratrum California, and veratrine.
159. Vesicants.
160. Vitamins, especially the antineuritic vitamin B, its isolation, identification, physiological effects, and study of its derivatives.
161. War gases.

Of course, some duplication and overlapping is unavoidable in such a compilation, but this has been held down as much as seemed consistent with the information sought to be conveyed.

Those who have not received copies of the circular letter and questionnaire, and who would like to take part in this coöperative undertaking, whether as chemists or as pharmacologists, will please communicate with Professor Marston T. Bogert, Havemeyer Hall, Columbia University, New York, N. Y.

A somewhat similar census, but covering pharmaceutical research, has just been completed by Professor H. V. Arny of the Columbia University College of

Pharmacy, as chairman of the Conference on Pharmaceutical Research, and has appeared in the JOUR. A. PH. A., Vol. 15, pp. 690–700 (Aug. 1925). It supplements in a very valuable way our own survey, and the two taken together give an excellent picture of present-day trends in these closely related fields of scientific investigation.

The cordiality of the response to our efforts may be gleaned from the following quotations from the questionnaires returned and gives some idea of the kind of coöperation offered in reply to the query concerning "special facilities:"

"A colony of albino rats (3000–4000) of known heredity and kept under constant environmental and dietary conditions."

"Complete equipments for chemical and animal work; representation at a large city hospital and opportunities of making clinical observations; skilled assistants; experienced coöperation with the Council of Pharmacy and Chemistry over several years."

"Well equipped pharmacological laboratory, well outfitted for chemical synthesis and for both animal experimentation and bacteriological or other forms of technic. Connection with clinicians of several hospitals for clinical trial. A number of graduate and medical students as assistants to pursue subsidiary investigations."

"Close coördination of the departments of biochemistry, pharmacology and physiology with the medical wards of the hospital."

"A laboratory equipped to do nearly any kind of pharmacological work."

"Opportunity to coöperate with a distinguished urologist in our college of medicine, through whose efforts some very important remedies have been introduced into urology."

"We have unlimited quantities of citrus fruit available and will furnish raw material or partly or completely purified derivatives for other investigators."

As to special fellowships and scholarships, the only ones reported were as follows:

University of Chicago.—The Seymour Coman Research Fellowship, of $2000–$3000 per annum, in chemistry applied to medicine.

Columbia University.—The Ferguson Fellowship, of $1000 per annum, for investigation and research in synthetic drugs and medicines, awarded every other year.

A Research Assistantship for the current year, of $1800, for the synthesis and investigation of organic compounds containing both arsenic and selenium.

Northwestern University.—About 12 fellowships for graduate students, with stipends up to $1000–$1200 per annum, for researches on the organic chemistry of arsenic and of mercury.

ORGANIC LABORATORIES,
COLUMBIA UNIVERSITY,
November 15, 1926.

Samuel L. Hilton presented two excellent papers in which he pointed out that great commercial advantage will be gained by pharmacists by taking up the study of filling and sterilization of ampuls and working with the physician in bringing about a better service for the patients and thereby he will also advance his own standing as a professional man.

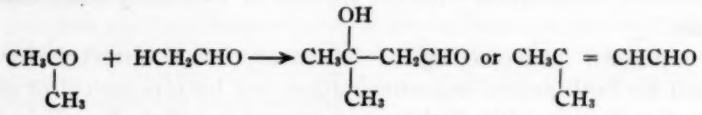
STUDIES IN THE GENUS MENTHA.*

12. THE SIGNIFICANCE OF THE PRESENCE OF METHYL-2-BUTANOL-4 IN MENTHA PIPERITA L. AND ITS IDENTIFICATION.**†

BY SAMUEL M. GORDON.[1,2]

The peculiar structure of certain plant constituents with five carbon atoms, also the more striking configuration of numerous phytochemical compounds, both chain and cyclic, with ten carbon atoms, have years ago suggested an hypothesis for their biogenesis.

Given actaldehyde and acetone, both of which have been found widely distributed in plants, their condensation to iso- compounds with five carbon atoms readily suggests itself.



Reactions of this type are assumed in the explanation of numerous biochemical processes. Either of these condensation products, whether resulting from aldol or true condensation, may be expected to yield an isovaleric aldehyde upon reduction. This, in turn, upon auto-oxidation and auto-reduction will yield the corresponding primary isoamyl alcohol on the one hand and the corresponding isovaleric acid on the other.[3]

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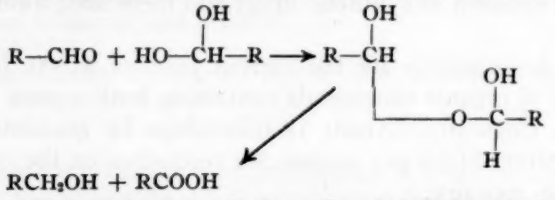
* From the Wisconsin Pharmaceutical Experiment Station, Madison, Wis.

** Abstracted from a portion of a thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Chemistry at the University of Wisconsin, June 1926.

† Since this report was completed, Neuberg and Windisch (*Biochem. Z.*, 166, 478 (1926)), have shown that isovaleric aldehyde undergoes auto-oxidation and reduction by means of B. ascendens in the presence of $CaCO_3$ and salt solution. It is interesting to note that the authors have found auto-oxidation and reduction of acetaldehyde to ethyl alcohol and acetic acid to take place both in the absence and presence of atmospheric oxygen. Thus KCN, when added to the reaction mixtures did not hinder the course of the reaction. This behavior is in agreement with the newer views on the Cannizaro reaction recently advanced by Meerwin and Schmidt (*Ann.*, 444, 229 (1925)). It is supposed that the intermediate product is of a half-acetal nature, thus

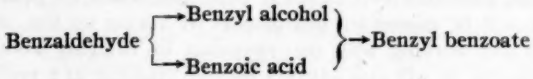


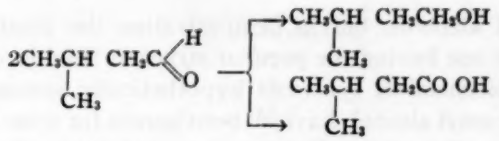
The further bearing of this reaction upon the formation of alcohols and acids in connection with the biochemistry of the Mints is now being studied in this laboratory.

[1] National Research Council Fellow in the Biological Sciences.

[2] Wrigley Fellow, 1924–1926.

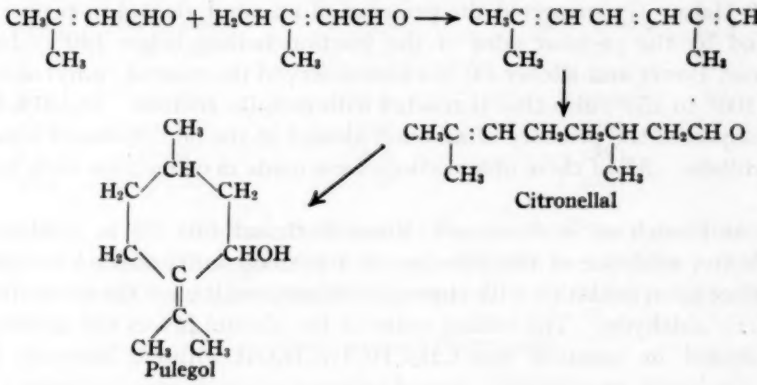
[3] Other illustrations observed in plant biochemistry involving the simultaneous oxidation and reduction of an aldehyde are:





These supplementary reactions are assumed in not a few instances as the most rational explanation of the formation of certain substances, existing side by side, or in the form of esters resulting upon condensation of alcohol and acid.

The further condensation of two molecules of the pentenoic aldehyde in question, of the partial reduction of the aldehyde with ten carbon atoms resulting, also the cyclization of the reduced aldehyde to a compound of the striking configuration of many volatile constituents of plants, may receive mention here merely as further indication of the biochemical importance of the reactions indicated above.



Without pointing out how the reactions, merely indicated here, can be utilized in the rational explanation of numerous biochemical phenomena, the few data given may suffice to suggest the importance of any and all experimental facts contributory to a verification of the biochemical hypothesis involved.

Peppermint oil has been known to contain isovaleric aldehyde, isovaleric acid and presumably amylvalerate (1). The presence of an amyl alcohol in the plant, therefore, seemed well nigh a foregone conclusion. However, definite proof of this assumption has hitherto been wanting. This proof has been made possible by the coöperation of A. M. Todd and Co., who in 1922 contributed about 150 pounds of a "Vorlauf" from not less than 12,000 pounds of peppermint oil to the study of the "Biogenesis of the Mints" by the Wisconsin Pharmaceutical Experiment Station. But even with this large amount of material, the amyl alcohol fraction amounted to not many cubic centimeters.

The real significance of this bit of chemical research into the life processes of the peppermint plant, consisted, not in proving the presence of any one of the

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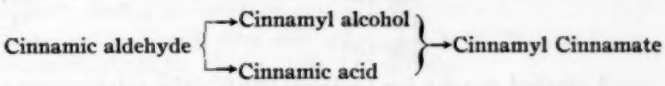

The reaction appears to be of widespread importance in the plant kingdom.

eight isomeric amyl alcohols, but in demonstrating the identity of the alcohol in question with the one having the peculiar structure used in the above formulas expressive of the biochemical synthesis hypothetically assumed. Inasmuch as the several isomeric amyl alcohols have all been known for some time, and since the presence of the alcohol has repeatedly been demonstrated in plants, the task would seem very easy provided a reasonable amount of material were available. Yet a merely casual perusal of the literature, both structural and phytochemical, will reveal that the task of definite identification is by no means as easy as might be assumed. Indeed, the satisfactory accomplishment of this apparently simple task seemed to call for a reëxamination of the entire group of amyl alcohols and their derivatives. Having indicated the fundamental biochemical significance of the several related groups, the statement that our knowledge of these carbon compounds with five carbon atoms is in need of revision may not seem exaggerated. Such work as has been done in this direction will be reported in another place.

In 1893 Halsey (2) suspected the presence of an amyl alcohol in peppermint oil, suggested by the peculiar odor of the fraction boiling below 140°. In the following year, Power and Kleber (3) likewise observed the odor of "amyl alcohol" in fraction 100° to 155°, also that it reacted with metallic sodium. In 1919, E. R. Miller (4) suspected the presence of an amyl alcohol in the oil cohobated from the aqueous distillate. All of these observations were made in connection with American oil.

So far as French oil is concerned, Roure-Bertrand Fils (5) in 1909 supply somewhat better evidence of the presence of a primary amyl alcohol in fraction 131–132°, since upon oxidation with chromic acid mixture it gave the characteristic odor of valeric aldehyde. The boiling point of the alcohol favors the assumption that the alcohol in question was $CH_3CHCH_2CH_2OH$ without, however, being positive proof.

$$\begin{array}{l} \\ | \\ CH_3 \end{array}$$

The 100 pounds or more of "Vorlauf" from A. M. Todd and Company having been deprived of their aldehydes (6), the aldehyde-free portion was redistilled with steam into eleven large fractions. The first of these, in quantities of about 500 cc., was subjected to ordinary fractionation rather rapidly in order to prevent resinification as much as possible. All fractions collected below 140° and those collected between 140° to 150° were bulked and subjected to a more careful fractionation with the following results:

TABLE I.

Fraction.	Boiling point.	Volume.
1	88–90°	71.0 cc.
2	90–93	154.0
3	93–95	104.0
4	95–96	7.0
5	96–100	0.0
6	100–110	0.0
7	110–120	11.0
8	120–130	83.5
9	130–140	74.5
10	140–150	107.5

Since the amyl alcohol sought for boils at 131.0°, the ester values of Fractions 8, 9 and 10 were determined before and after acetylation.

Fraction.	Saponification values. Before acetylization.	After acetylization.
120–130°	46.5	240.5
130–140	45.4	218.4
140–150	15.1	33.8

These figures reveal the presence of considerable free alcohol (an average of 36% computed as $C_5H_{11}OH$) in Fractions 8 and 9, whereas the last fraction contains but little, approximating the terpene fractions as to boiling point.

Inasmuch as Fractions 8 and 9 contained small amounts of ester (10.6% computed as amyl acetate) they were saponified with twice the calculated amount of KOH, without the use of solvent. The oil darkened as the reaction took place, becoming black after two hours. The saponified liquid was subjected to steam distillation. The aqueous distillate[1] was extracted with ether and the ether residue (1.0 cc.) added to the oily distillate. Two fractionations of this oil gave the following results:

Fraction.	Boiling point.	Volume.	Index refraction.	Density.
1	80–128°	13.5 cc.	....	....
2	128–129	9.1	1.4230	0.8253
3	129–130	7.0	1.4241	0.8254
4	130–131	3.7	1.4261	0.8258
5	131–132	3.4	1.4280	0.8244
6	132–133	1.9	1.4300	0.8272

Comparison of the constants here recorded with those recorded in the literature for the isomeric amyl alcohols did not afford much satisfaction. Several derivatives from the different fractions were prepared.

AMYL PHENYLURETHANE.

Attempts to react with phenylisocyanate at first gave liquid products only. Finally very cold weather was productive of better results in the crystallization of the products. The 3.7 cc. of fraction 130–131° when treated with 5 Gm. of phenyl isocyanate yielded but 1.4 Gm. of crystals as contrasted with a theoretical yield of 8.7 Gm. These melted at 40°. Crystallization from petroleum ether raised the melting point to 41° and several subsequent crystallizations from dilute alcohol to 43°.

Of the eight isomeric alcohols, the phenol urethanes of five have been reported:

n-butyl carbinol[2]	46°
diethyl carbinol[3]	48–49
isobutyl carbinol[4]	55
methyl ethyl carbinol[4]	30
dimethyl ethyl carbinol[5]	42

These figures, likewise, do not afford much satisfaction for the melting point agrees best with that of the tertiary dimethyl ethyl carbinol, and is 12 degrees lower than the melting point of the urethane of isobutyl carbinol.

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[1] "Isoamyl" alcohol is soluble in water 1:200.

[2] E. Blaise and L. Picard, *Ann. chim. phys.*, Ser. 8, 26, 261 (1912).

[3] C. Mannich, *Arch. für Pharm.*, 246, 182 (1904).

[4] W. Marckwald, *Ber.*, 37, 1049 (1904).

[5] E. Lambling, *Bull. soc. chim.*, Ser. 3, 19, 777 (1898).

3,5-DINITRO-BENZOATE.

Three and one-tenth Gm. of fraction 129–130° and 7.8 Gm. of 3,5-dinitro-benzoyl chloride were heated in a tube placed in a boiling water-bath for thirty minutes, and the reaction product poured in water. The crystals obtained upon standing and filtering, when dried, weighed 7.0 Gm. against 9.8 Gm., the theoretical yield. Recrystallized several times from dilute alcohol, the product melted at 55–56°. No change in the melting point was observed after several more crystallizations from ligroin. The ester prepared from a cabinet specimen of "isoamyl alcohol" melted at 61° after several crystallizations from alcohol.

Nitrogen determinations of both esters were made.

a.—0.1500 Gm. of ester from the peppermint oil yielded 12.1 cc. of N_2 at 24° and 741 mm. pressure.

b.—0.4000 Gm. of ester from the cabinet specimen yielded 36.2 cc. of N_2 at 21° and 746 mm. pressure.

Calculated for $C_{12}H_{14}O_6N_2$: 9.94%. Found: *a.*—9.94%. *b.*—10.14%.

Saponification of the ester from peppermint oil gave a value of 302, whereas the computed number is 282.

Those fractions of the "Vorlauf" which originally distilled below 140° were bulked and fractionated through a four bulbed column. This distillation caused a sharp break into two main portions, *viz.*, one set of fractions boiling between 88–96° and another boiling between 150–172°, with no intermediate fractions. The higher boiling fractions were reserved for later examination. The lower boiling portions gave positive tests for aldehydes with Schiff's reagent. Accordingly fractions boiling between 88–96° (total volume 227 cc.) were shaken for four days with 375 cc. of a saturated solution of $NaHSO_3$. No crystals separated. The aqueous layer was separated and treated as follows: extraction with ether and subsequent evaporation of the ether gave no residue. The liquor after the ether extraction was treated with $NaHCO_3$, steam distilled, and the distillate extracted with ether. No odor or residue of the amyl aldehydes was apparent.

The oily layer was treated with $NaHCO_3$, steam distilled, separated from water and dried over Na_2SO_4 for 24 hours and distilled with the following results:

TABLE II.

Fraction.	Boiling point.	Volume.
1	83–115°	48.2 cc.
2	115–125	27.0
3	125–135	lost
4	135–145	13.3
5	145–155	19.5
6	155–170	34.3

The odor of Fraction 2 suggested amyl alcohol, and esterification determinations gave the following results:

Saponification no. before acetylization 31.3 = 4.9% $C_5H_{11}OH$
Saponification no. after acetylization 226.0 = 51.38% $C_5H_{11}OH$.[1]

Meanwhile careful dephlegmation of the fractions boiling at 150–170° was made. This yielded 170 cc. of an oil boiling below 140° in which the odor of amyl alcohol was very apparent.

[1] The acetylized oil had a decided odor of amyl acetate.

A redistillation of this oil through a fifteen-inch Vigreux column yielded:

TABLE III.

Fraction.	Boiling point.	Volume.
1	83–120°	19.4 cc.
2	120–130	26.4
3	130–132	19.8[1]
4	132–135	14.3
5	135–140	16.1
6	140–150	14.1
7	150–160	28.1
8	160+	12.7

[1] Odor of amyl alcohol very apparent.

Fraction 130–132° was dried over Na_2SO_4 and treated with 5 Gm. of α-naphthyl-isocyanate according to Neuberg and Kansky (7). After standing for twelve hours, 4.0 Gm. of a crystalline product were obtained. Crystallization from petroleum ether yielded a product melting at 61°. Repeated crystallization caused no change in the melting point.

Neuberg and Kansky state that the α-naphthyl-urethane of isobutyl carbinol (isoamyl alcohol) melts at 67–68°. Hence a urethane was prepared from a sample of isoamyl alcohol from Eastman Kodak Company and found to melt at 61°.

A mixture of the two melts at 60–61°, hence it may be concluded that isobutyl carbinol is present in American peppermint oil.

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(2) R. I. Halsey, *Proc. Wis. Pharm. Assoc.*, p. 89 (1893).
(3) F. B. Power and C. Kleber, *loc. cit.*
(4) E. R. Miller, *Wis. Pharm. Expt. Station, Circular* No. 7, 8 (1919).
(5) Anon, *Report Roure-Bertrand Fils*, p. 40 (April 1919).
(6) R. E. Kremers, *Am. J. Pharm.*, 98, 85 (1926).
(7) C. Neuberg and E. Neumann, *Biochem. Z.*, 20, 445 (1909).

THE BOTANICAL IDENTITY OF MA HUANG.

BY OLIVER ATKINS FARWELL.

In the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION for August 1926, Vol. XV, pages 625 to 639, Chen and Kao present a review of the work that has been done on *ephedrine* and *pseudoephedrine;* the former is obtained from Ma Huang which has been known in Chinese medicine for 5000 years and which is identified as *Ephedra vulgaris* Rich, var. *Helvetica* Hook. f. and Thompson and the latter is obtained from a European plant identified by Arthur Meyer as *Ephedra vulgaris* var. *Helvetica*. Also, they say: "It appears, therefore, probable that the plant *Ephedra vulgaris* var. *Helvetica* yields *ephedrine* when grown in China, but *pseudoephedrine* when grown in Europe. Such analogy can be found in Oil of Turpentine, for the French and Spanish oils contain *l-α-pinene* whereas the American and Greek oils the dextrogyrate modification."

The statement in the quotation above that a species or variety will produce one plant base in one region and a different one in some other region is very surprising, to say the least. It is more reasonable to believe that the species are distinct and that the botanical identifications are wrong and ought to be more thoroughly investigated. As to the Oil of Turpentine, that produced in America is from *Pinus palustris* Mill. and *P. Taeda* Linn, while that of Europe is from *P. sylvestris* Linn, *P. Pinaster*, Ait. and of other species none of which are the same as the American, so that the analogy suggested is true *only and if* "Ma Huang" *is not identical* with *Ephedra Helvetica* of Europe. The European plant producing *pseudoephedrine* is *E. Helvetica* C. A. Meyer; by some it is considered as a "variety" or "subspecies" of *E. distachya* Linn (*E. vulgaris* Rich).

Not being able to trace the name *E. vulgaris* var. *Helvetica* Hook. f. and Thompson as given to the Ma Huang by Nagai according to Chen and Kao, I wrote to the Director of the Royal Botanic Gardens at Kew, England, for information concerning it, which was very courteously supplied. I quote from the Director's letter as follows: ".....The name *Ephedra vulgaris* var. *Helvetica* appears to have originated in the Kew Herbarium where certain specimens of Hooker & Thompson's Indian herbarium bear this name. It has also been found in a manuscript list of the same herbarium. It was apparently supposed that the specimens were identical with *Ephedra Helvetica* C. A. Meyer and that *E. Helvetica* was only a variety of *E. vulgaris* Rich, but that supposition proved to be erroneous. The specimens have since been named by Dr. Stapf as *E. intermedia* Schrenk and C. A. Meyer, var. *Tibetica*."

From the above quotation, it will be observed that *Ephedra Helvetica* C. A. Meyer, the European plant, is not identical with the Asiatic *Ephedra intermedia* var. *Tibetica* (*Ephedra vulgaris* var. *Helvetica* Hook. f. and Thompson). Also that the name *E. vulgaris* var. *Helvetica* Hooker and Thompson is only a MS name, has never been properly published and therefore cannot be invoked to designate "Ma Huang," which has been referred to also as *Ephedra equisetina Bunge*. Dr. Stapf was unable to identify Ma Huang as no material had ever been sent him. At his suggestion, this oversight was promptly remedied. The following quotation from the report of Dr. Stapf on samples of commercial Ma Huang indicates that it is an undescribed species, of which flowers and fruits are still unknown and that it may pass for commercial purposes under the provisional name of *Ephedra Sinica* Stapf. "It differs from all the Chinese *Ephedras* I have ever seen in the combination of the following characters—low tufted growth, scanty branching above the base, slender almost smooth pale branches, the conspicuous (though short) subulate spreading or recurved blades of the sheath leaves and the membranous whitish sides of the sheaths. I have seen neither flowers nor fruits and I have therefore hesitated to describe the plant. It is very desirable that these should be procured. If a provisional name is required in the meanwhile for trade purposes *Ephedra Sinica* might be used." Dr. Stapf says also that Ma Huang is identical with a specimen collected by F. N. Meyer in August 1913 near Tan hwa, province of Chili.

DEPARTMENT OF BOTANY,
PARKE, DAVIS & CO.,
DETROIT, MICH.

THE BIOLOGIC STANDARDIZATION OF DIGITALIS BASED ON THE RELATIONSHIP OF THE M. L. D. TO THE HEART WEIGHT.*

BY W. R. BOND.

The misconception that even one or two animals suffice to determine with accuracy the potency of a digitalis preparation, when assayed by the Cat Method of Hatcher and Brody, may often lead to serious error. Attention has been called to the fact that in a large number of series of assays there occur wide variations in the values obtained when the M. L. D. is calculated per unit of cat weight. While it has been recognized that two cats in the same series may be abnormal in opposite directions, and their average approximate the true potency of the preparation, it is also possible, and with equal frequency, for the two animals to be abnormal in the same direction and lead to an error in many instances amounting to as much as fifty per cent of the average M. L. D. Experiments have shown that it is only possible by employing a large number of animals that accuracy can be attained, not only in the standardization of digitalis, but in every biologic assay method as well.

The question arises—Does the total body weight accurately represent the amount of animal tissue accessible to the action of the drug? One frequently encounters in the same series two cats requiring approximately the same amounts of digitalis to produce death, yet there is quite a difference in their body weights and hence in unit doses. Autopsies upon these animals often reveal that whereas one may show a considerable amount of subcutaneous and visceral fat, the organs of each are very nearly of the same size and weight.

Obviously such difficulty might in part be overcome by a careful selection of animals, or by basing one's calculations of M. L. D. upon some portion of the body which bears a constant ratio to the body weight in normal cats. Since with intravenous injections it seems logical to suppose that the degree of manifestation of action would depend largely upon the concentration of the drug in the blood stream, blood volume might offer a suitable basis for these calculations. The determination of blood volume, however, does not seem practical for this purpose, aside from the uncertainty in the results obtained. The question of accuracy alone is sufficient to render its use unwarranted.

The relationship of certain organs of the body to the total body weight has been thoroughly worked out in the case of the white rat, *Mus Norvegicus*, and it has been shown that after the early period of development of the animal the heart weight bears a constant ratio to the body weight. Information of this nature concerning the cat has not been obtained on account of the difficulty in securing sufficient material of one species for making such observations. It is reasonable, however, to suppose that a similar ratio exists. When the increase in body weight is due to an accumulation of fat, there may be a slight compensatory hypertrophy of the heart, but there is little reason to believe that the ratio of heart to total weight is maintained under these circumstances. On the other hand it seems fair to assume that an increase in blood volume might result in a compensatory enlargement of the heart which would more closely preserve the relationship of heart to blood volume.

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* Scientific Section, A. PH. A., Philadelphia meeting, 1926.

On the above assumption, and aside from the specific cardiac action of digitalis, a series of assays has been conducted to compare the results obtained when the M. L. D. of the drug is calculated per Kg.-body weight, and per Gm.-heart weight. No attempt has been made to select animals for these experiments, the material received in the laboratory being rather cosmopolitan in its nature. The assay is conducted essentially as described by Hatcher and Brody. After recording the total weight, the thorax is opened, the heart stripped from the pericardium and the vessels cut close to their proximal ends. Longitudinal incisions are made in each chamber and the heart washed in running water until free of blood, after which the excess moisture is removed by means of a dry towel and the heart weighed.

Table I shows the results obtained on Tincture No. 45.

TABLE I.

ASSAY OF TINCTURE OF DIGITALIS NO. 45.

No.	Wt. Kg.	Cc.	Mg./Kg.-body wt.	Gm.-heart wt.	Mg./Gm.-heart wt.
1	2.15	20	93.0	8.3	24.05
2	2.6	29	111.6	11.4	25.4
3	2.05	20.5	100.0	8.1	25.3
4	2.27	23	101.3	9.8	23.4
Averages			101.4		24.5
Greatest percentage deviation			9.97		4.48

This table shows no marked deviation for either method of basing the calculations of M. L. D.; however, the greatest deviation from the average is 9.97% when the unit dose of digitalis is expressed in mg. leaf per Kg. cat, and 4.48% on the base Gm.-heart, giving 45% more accuracy in favor of the latter method of assay.

In the second series cats Nos. 1 and 2 with weights of 3.5 and 2.27 Kg., respectively, required about the same amounts of digitalis. The M. L. D. calculated on the basis of total weight gives for the former 63.8 mg., for the latter 119.0 mg. This is a typical example of abnormal variability in opposite directions. Attention is also called to the fact that whereas there was a variation of 1.23 Kg.-body weight, the difference in heart weight amounted to only .7 Gm., giving 21.4 mg. as the M. L. D. for the first and 24.7 for the second. The combined results of the series showed maximum deviations of 39.3% and 13%, respectively, or 62% greater when the total weight is used as the basis.

TABLE II.

ASSAY OF TINCTURE OF DIGITALIS NO. 45.

No.	Wt. Kg.	Cc.	Mg./Kg.-body wt.	Gm.-heart wt.	Mg./Gm.-heart wt.
1	3.5	24	63.8	11.2	21.4
2	2.27	26	119.4	10.5	24.7
3	3	35.5	116.7	12.7	27.9
4	2.93	27.5	93.8	12.3	22.6
5	2.4	29	120.7	10.5	27.6
Averages			103.1		24.8
Greatest percentage deviation			38.1	13.7	

The result of series III run on a freshly prepared tincture showed a maximum deviation 33% greater when the M. L. D. was calculated per Kg.-body weight.

TABLE III.

TINCTURE P. D. LEAF—1925.

No.	Wt. Kg.	Cc.	Mg./Kg.-body wt.	Gm.-heart wt.	Mg./Gm.-heart wt.
1	2.1	14.8	70.5	7.45	19.9
2	2.31	14.2	61.5	7.88	18.0
3	3.35	26.8	80.0	12.7	21.1
4	3.54	25.0	70.6	14.8	16.9
5	2.215	22.1	99.8	9.2	24.0
Averages			76.5		20.0
Greatest percentage deviation			30.5		20.0

In series number IV decerebrate cats were used. It will be observed that cat No. 3 required nearly twice as much tincture as No. 12. The difference in weight, however, is not proportionate, there being about 16% difference in weight against 47% difference in quantity of digitalis required. Attention is also called to the heart weights amounting to 13.4 and 7.3 Gm., respectively, a variation of about 45%, which is in excellent keeping with the total quantity of digitalis required for each animal. The average of this series of thirteen animals shows 63.1 mg. of leaf per Kg. cat and 14.45 mg. per Gm.-heart. In this series the percentage deviation from the average has been calculated in each case; while but eight of the thirteen determinations showed less deviation when calculated per Gm.-heart, the average percentage deviation of the series showed 12.9% for body weight and 9.7% for heart weight. As might be expected these averages will not only approach each other, but both in turn approach zero as a limit, as the result of increasing the number of animals in the series.

TABLE IV.

DECEREBRATE CATS—TINCTURE P-D LEAF—1925.

No.	Wt. Kg.	Cc.	Mg./Kg.-body wt.	Gm.-heart wt.	Mg./Gm.-heart wt.	Percentage deviations. Body wt.	Heart wt.
1	2.54	19.3	76.0	11.2	17.2	25.2	19.0
2	1.95	15.6	81.4	10.2	15.3	28.9	5.90
3	2.67	17.0	64.0	13.4	12.8	1.42	11.4
4	1.715	13.8	80.2	8.7	15.8	11.25	9.35
5	2.65	20.0	75.4	12.7	15.7	19.45	8.64
6	4.06	25.0	61.3	19.4	12.8	3.05	11.4
7	2 05	12.0	58.5	9.2	13.0	7.26	10.0
8	1.99	11.6	58.3	8.0	14.5	7.59	.346
9	2.595	17.0	65.5	10.3	16.3	3.95	12.8
10	2.27	14.5	63.8	9.3	15.5	.9	7.25
11	2.965	17.0	57.3	12.5	13.6	9.17	5.87
12	2.25	9.0	40.0	7.3	12.3	36.6	14.9
13	2.02	11.2	54.6	8.55	13.1	13.45	9.35
Averages			63.1		14.45	12.9%	9.7%
Greatest percentage deviation						36.6%	19.0%

CONCLUSION.

In the Cat Method of Hatcher and Brody for the assay of digitalis, the error due to individual variability seems to be lessened from 30% to 50% when the M. L. D. is calculated on the basis of the heart weight.

Thanks are due to Parke, Davis & Co. for the digitalis leaf used in making the tinctures assayed in Tables III and IV. I am also indebted to Mr. H. B. Haag for much of the data on decerebrate cats.

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DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY,
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ANALYSIS OF ORGANIC SILVER COMPOUNDS.

BY BERNARD SALKIN.

It is not always an easy procedure to determine the metallic part of a substance when the latter is in organic combination or associated with a large amount of organic matter. When the element is easily reduced to the metallic state the simplest method is to burn the substance. When the element forms volatile compounds on ignition, a more complicated procedure is required.

In order to have a method applicable to both classes of elements the author, several years ago, adopted and modified the Lehman method,[1] which was originally used for the determination of arsenic in arsphenamine. This method is of special interest to pharmaceutical chemists, for the analysis of Argentum Proteinicum Mite and Fortior. The latter is a true silver protein salt (of acids similar to protalbinic and lysalbinic acids) dissolved in excess of the same protein substance, while the former is true *colloidal* silver with a protective colloid.

The method has the following advantages:

1. In the case of a volumetric determination, the analysis is finished in the same Erlenmeyer flask in which it is started.
2. A light-colored solution is always obtained for titration.
3. There are no interfering elements to be removed when finishing the assay gravimetrically.

Method for Argentum Proteinicum Mite and Fortior:

Weigh a one-Gm. sample into a 300-ml. Erlenmeyer flask; dissolve in 10 mls. of water and add 10 mls. of concentrated H_2SO_4; cover the neck of the flask with a small watch glass. Begin to add, immediately, small portions of finely powdered $KMnO_4$. Keep the solution hot. The addition of $KMnO_4$ is discontinued when a deep red solution is obtained; the red color remains for more than five minutes. About two Gm. of $KMnO_4$ are required.

Heat the solution to boiling, wash down the sides of the flask and add finely powdered oxalic acid until the red color disappears, and the oxides of manganese are dissolved. Quite often, the last traces of these oxides are not dissolved until the solution is boiled; an excess of oxalic acid is to be avoided. Again heat solution, and boil for a few minutes; add 5 mls. concentrated nitric acid, and heat on steam-bath for 15 minutes. Cool the flask and contents, and add 50 mls. of water, and 2 mls. of 10% solution of ferric alum. Titrate with $N/10$ potassium thiocyanate V. S., to the regular end-point.

The number of mls. of $N/10$ potassium thiocyanate V. S. used multiplied by 1.08 and divided by weight of sample equals the per cent of silver.

BROOKLYN, N. Y.

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SIXTH INTERNATIONAL CONGRESS OF THE HISTORY OF MEDICINE.

The Sixth International Congress of the History of Medicine will be held at Leyden and Amsterdam, Holland, July 18–29, at the universities of these cities. Papers are invited from members on subjects connected with the history of medicine and allied sciences; they should not exceed ten pages, and the titles should be addressed to the general secretary, Dr. J. E. Kroon, Leyden, before April 1st.

THE OFFICIAL MENSTRUA.*

BY WILBUR L. SCOVILLE.

For the exhaustion of vegetable drugs in making extracts, fluidextracts and tinctures—a total of 233 of these preparations—the U. S. Pharmacopœia and National Formulary use 20 different alcoholic strengths of menstrua, besides water, the menstrua which contain acid or glycerine, and aromatic spirit of ammonia.

These alcoholic menstrua are as follows:

Menstruum.				
Alcohol.	Water.	Sp. gr.	Strength.	No. of preparations used in.
1	0	0.8095	95.0%	34
95	5	0.8243	90.9%	1
9	1	0.8384	86.5%	1
8	1	0.8413	85.6%	1
85	15	0.8516	82.0%	1
5	1	0.8569	80.2%	3
4	1	0.8645	77.4%	15
3	1	0.8768	72.8%	36
7	3	0.8886	68.1%	1
675	325	0.8943	65.7%	1
2	1	0.8977	64.3%	25
65	35	0.9016	62.6%	1
5	3	0.9053	61.0%	1
3	2	0.9110	58.4%	10
1	1	0.9311	49.0%	69
3	4	0.9441	42.0%	1
2	3	0.9490	39.0%	2
1	2	0.9582	32.8%	7
1	3	0.9696	24.0%	5
1	7	0.9838	11.8%	1
0	1	1.0000	0.0%	17

(Glycerin is used in many of the above, but is ignored here for reasons which will be explained later.)

If these menstrua were divided between the drugs and preparations with any degree of uniformity, it would mean an average of about 11 preparations to each menstruum, and an average variation of 5 per cent of alcohol in the menstrua. But the table discloses a different condition. Of the 233 preparations, 206, or 88+ per cent of all are made with seven different strengths of menstrua.

Thus, 95% alcohol is used for 34 preparations, 77.4% alcohol for 15, 72.8% alcohol for 36, 64.3% alcohol for 25, 58.4% alcohol for 10, 49% alcohol for 69, and water for 17 preparations. (The last have alcohol added, except extracts, but water is the menstruum used.) And 10 of the menstrua are used for one preparation each, while, four are employed in 17 preparations, there being 2, 3, 5 and 7 respectively for each.

In other words, 7 different strengths of alcohol, or water are sufficient for 88 per cent of all the preparations, four others are used in a remaining 7 per cent, and ten different menstrua are used for the remaining 4 per cent of preparations.

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Philadelphia meeting, 1926.

If the smaller 12 per cent of the preparations possess peculiarities which require a variety of individual menstrua, they are scientifically sound, but if these menstrua are the result of accident in experimental research, of tradition, or of isolated consideration, then they need revision.

Most of the menstrua used in extraction of drugs are the result of empirical work, and are adopted independently. As an instance of how discrepancies will occur take the Fluidextract and Tincture of Calendula of the N. F. V. This drug has usually been extracted with 95% alcohol, but the sub-committee on Fluidextracts recommended a change to 64% alcohol for the fluidextract. The sub-committee on tinctures did not agree with this, and retained the 95% alcohol for the tincture. Thus the official Fluidextract of Calendula is made with 64% alcohol, and the Tincture is made with 95% alcohol. Obviously one of these sub-committees is mistaken in its judgment. A series of experiments on different lots of Calendula is needed to determine which is right.

With some of the menstrua, the authority evidently had only one preparation in mind. Thus Tincture of Cinnamon, made with a mixture of 675 cc. of alcohol and 325 cc. of water is obviously designed as a menstruum for 1000 cc. of tincture only. (The present menstruum contains some glycerin in place of water.) Tincture of Gelsemium, with a menstruum of 650 cc. of alcohol and 350 cc. of water is designed similarly—for 1000 cc. of tincture, though the mixtures stated are not sufficient in either case for the required yield. Furthermore the menstrua for the Fluidextract and for the Tincture of Gelsemium are not the same—one being 77 per cent and the other 62.5 per cent alcohol.

Again it seems very probable that the experimenters in either case did not realize that a simple mixture of two volumes of alcohol and one of water contains within 1.5 per cent as much alcohol as either of the two large-figured menstrua. This factor seems to have been overlooked in many cases. The table has been a revelation in that respect, and a surprise also. Thus one would not have guessed that a mixture of 8 volumes of alcohol and 1 volume of water is practically the same as that of 9 volumes of alcohol and 1 of water, but the actual difference is less than 1 per cent of strength. It is noticeable that most of the separate menstrua are close enough to one of the six or eight leading menstrua to warrant a suspicion, at least, that most of them could be merged into the more common or simpler mixtures without any sacrifice of value. A brief study of the table suggests that the 21 menstrua there listed might well be cut to 8 or 10.

At least some corresponding preparations might be unified. For instance, no good reason is apparent for having three individual and different menstrua for such similar tinctures as Tincture of Capsicum (U. S. P. 90.9%), Tincture of Capsicum and Myrrh (N. F. 85.6%) and Tincture of Ginger (U. S. P. 82.0%). If 95% alcohol is too strong, a single 80 per cent or 85 per cent should be satisfactory for all these.

Also why should Tincture of Ignatia be made with 85.6% alcohol, and the Extract with 72.8%, particularly when the last menstruum is satisfactory for Tincture of Nux Vomica?

Why should Tincture of Aconite be made with 68.1% alcohol and the Fluidextract with 72.8%? Or Tincture of Gelsemium with 62.6% alcohol and the Fluidextract with 77.4%? And Tincture of Hop with 49% and the Fluidextract

with 61%? Experience has shown that in general the best menstruum for a tincture is the same as for the corresponding fluidextract, and in most of the cases in the Pharmacopœia and National Formulary the two correspond.

A menstruum serves three functions: (1) it extracts the active principles of the drug with as little extraneous matter as may be practicable, (2) it preserves the activity and usefulness of the drug or preparation under varying conditions of storage and exposure, and (3) it makes the preparation as economical as is consistent with the first two.

The first function is the simplest. It needs only a knowledge of the chemical and physical character of the drug, and of its active constituents to select the menstruum. If the active principle is resinous, a strongly alcoholic menstruum is needed. If the activity is due to alkaloids, glucosides or similar principles, weak alcohol or water may suffice. If sugars, gums, tannins, etc., are the main desired ingredients, water will extract these. But attention must be paid to the fact that while water or weak alcohol can extract the active constituents, they may also extract so much of gummy, saccharine, albuminoid, tannoid and coloring substances that the product is unduly dilute, and also more prone to deteriorate.

The second function is not as simple. Stability of the preparation now means not only freedom from fermentation or molding, or sedimentation, but it includes also the prevention of any change which would reduce the value of the preparation in any way. Until recent years, precipitation was the main criterion of stability, but recent work is recognizing that important and detrimental changes may occur without any precipitation.

The author showed in a previous paper[1] that some of the astringent preparations may entirely lose their value as astringents and yet show no evidence of change by precipitation.

Tincture of Digitalis has never been troublesome through precipitation, but we know that when made with diluted alcohol it soon loses it's potency though remaining clear, while stronger alcohol preserves the activity. Tincture of Gentian is commonly made with stronger alcohol in Europe than here, because European pharmacists and physicians place more value upon an unchanged gentiopicrin than do we.

This function is aided in many cases by the addition of acids to the menstruum, or by use of glycerin. While the addition of acid to a menstruum frequently increases its solvent power, thus aiding extraction, recent studies tend to show that acids play their most important part as stabilizers. Witness the recommended addition of acid to Tincture of Aconite, and to Tincture of Digitalis. Also the recent studies on p_H values in tinctures and fluidextracts. The value of hydrochloric acid in cinchona preparations is partly in facilitating extraction but more in stabilizing the preparations.

Glycerin is used in 17 of the official fluidextracts and in 10 tinctures. In all but two of these it is used in the menstruum. But it has been shown that in most cases glycerin hinders extraction, and the drugs are more rapidly exhausted by the aquo-alcoholic menstruum without glycerin, except in the case of the astringent drugs. Glycerin is a good solvent for tannin, and aids materially in extracting this principle. But in other drugs glycerin will serve its purpose

[1] "Permanence of Some Astringent Preparations," Jour. A. Ph. A., p. 334 (1912).

better when added to the percolate. It serves well as a stabilizing agent,[1] but not as an extracting agent. Furthermore when dilutions are made of super-standard percolates of alkaloidal preparations, to bring them to standard, the dilution should be made with the mixture of alcohol, water and glycerin that is directed for the initial percolation, rather than with alcohol and water as is directed.

The full value of glycerin as a stabilizer would thus be secured in the adjusted product, which is not obtained under the present plan. Except for the astringent drugs—nearly all of the liquid preparations of which need better menstrua than are now used—it is better practice to add the glycerin to the percolate than to use it in the menstruum.

As for the third function—economy—it is scarcely necessary to point out that any reduction in costs at the expense of reliability or activity is not economy. Active and reliable preparations are the prime considerations and are always the most economical.

A tendency has been apparent to reduce the alcoholic strength of menstrua, partly to show a coöperative spirit with the prohibition enforcement, and partly to reduce costs. Both of these are laudable if made secondary to activity and reliability. But the tendence of recent studies is toward stronger alcoholic menstrua as needed for reliability in action.

Alcohol rejects more extraneous matter than does water, and an alcoholic solution retards hydrolysis and oxidation—two factors that make for deterioration. Aqueous and weakly alcoholic solutions are more prone to deteriorate through these actions as well as through fermentation. Thus while the active principles of a plant may be soluble in water or weak alcohol it does not follow that weakly alcoholic liquid preparations of the drug are suitable.

Aside from the larger amount of extraneous matter which water usually extracts from plants, and which may act as diluents in making solid or powdered extracts, the presence of an undue amount of extraneous matter invites changes which may precipitate or hydrolyze some of these, and some of the activity is very probably entangled in the reactions and thus lost. Experience has shown that when precipitation of inert matter occurs alkaloids are carried down with it, although the alkaloids are quite soluble in the menstruum.

The menstrua used in the majority of the official preparations seem to be satisfactory, but some certainly need revision. And a further unification of menstrua will help to prevent discrepancies, as well as simplifying the formulas.

LABORATORY OF PARKE, DAVIS AND CO.,
DETROIT, MICH.

LABORATORY FIRST AID CHART.

The Committee on Safety and Safe Guards of the Department of Chemistry of the College of the City of New York has prepared a list of "First-Aids" for the treatment of laboratory accidents. This list deals with ordinary injuries likely to occur within the laboratories and gives detailed directions for their treatment by various chemicals and products. The list has been amended and amplified by Dr. Alex O. Gettler, toxicologist for the Medical Examiners office of New York City. The list is to be published in chart form and copies are to be supplied laboratories throughout the country.

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[1] "The Function of Glycerin in Tinctures and Fluidextracts," JOUR. A. PH. A., p. 868, (1920).

THE COST OF FREE GOODS.*

BY W. BRUCE PHILIP.

The Cost of Free Goods. Does this title seem foolish? Do we not have invisible hair nets and invisible face powder in many shades and color? Can you not see and feel vanishing creams? Titles or names mean so little that a true knowledge of words used must tell every story. Business means success or failure. Success is achieved and failure overcome or prevented by knowledge. Therefore, any knowledge on the cost of free goods should be of value.

In talking to the credit men of our local wholesale drug houses as to why certain drug stores are not successful, I was told a large percentage of the failures were due to improper buying. In analyzing improper buying I found that a large number of druggists did not understand "quantity buys." They faced dangers without appreciating them. The only "stop, look and listen signs" were their bank accounts. This sign was not noted before the danger was reached, but after the danger was passed. Very often it was good luck alone that allowed the druggist to miss the danger sign and arrive at a position where the sign could be read. Can we move this "stop, look and listen sign" from past the danger to some bright noticeable place in advance of the danger, so that the retail druggist can be properly warned? Surely, a careful consideration of buying will help materially. If we understand what we are doing and place the proper value on words and contracts, much trouble will be avoided.

I will not endeavor to discuss all phases in quantity buying of merchandise, but only discuss the commercial term "free goods." Frankly, free goods are seldom offered the retail druggist. I do not desire to criticise the salesmen or firms that advertise or try to sell deals containing an offer of so-called free goods. I do criticise the retail druggist who swallows this bait, carrying the hook, line and sinker, without a thought as to the true meaning of the word "free." Let us start with a practical illustration:

You are offered a gross of a tonic at $8.00 per dozen and you are to receive one dozen of the tonic free. When the goods and the bill come to your store you find a package containing one gross and one dozen of the tonic and receive a bill reading "12 dozen at $8.00 equals $96.00." Right under this you will find a line that reads: "One dozen FREE" and the word Free in large type to impress you as to the terms of the deal. What are you going to mark this merchandise? Will your marking tell you that this tonic costs $8.00 a dozen or 67 cents a bottle? If so, you are putting $104.00 worth of so marked merchandise on your shelf and for this same merchandise you will pay only $96.00. Is this fair to your next inventory? Would you buy a drug stock marked in that way and pay inventory price? You certainly would not. Then at what price should these goods be marked? Can we not truthfully say we have bought a certain lot of merchandise for which we have paid a certain price? Is that not the whole and only story as far as cost is concerned? If so, thirteen dozen cost $96.00. One dozen cost $96.00 divided by 13, or $7.39 per dozen. This divided by 12 gives 62 cents per bottle.

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* Read before the Section on Commercial Interests, A. PH. A., Philadelphia meeting, 1926.

If you do not agree with me, which dozen is the free dozen and how does this dozen differ from the other 12 dozen in the shipment. Under what principle of sound and fair merchandising are you going to mark this dozen that you say costs you nothing the same retail price that you mark the other merchandise that you say costs you 67 cents a bottle? Will not such a system of marking your goods make of your business a guess as to its success and increase your chance of business failure?

Many deals and offers of so-called "free goods" differ slightly from the above example. Time will prevent the consideration of all. Still one or two may be presented to you in an endeavor to show that thought and knowledge are essential to considering this commercial problem. You are offered the three dozen of a live seller, say Milk of Magnesia, at $4.00 a dozen, and one dozen 25¢ liver pills, dyspepsia tablet, or what-not, of a wholesale value of $2.00 per dozen, free. It is a simple problem in arithmetic to consider this dozen of liver pills at $2.00 per dozen as one-half dozen units worth $4.00 a dozen. Then having found the cost of $^1/_{12}$ of a dozen of the $4.00 a dozen unit, the price of the liver pills is determined by dividing by 2. While the Milk of Magnesia may be a good seller the liver pills may be of the slow turnover type. Is it fair to reduce the price of the magnesia and fool yourself as to an extra profit, when actual results may find the magnesia all sold and most of the liver pills on hand? This thought is one of the "stop, look and listen signs" that may make you think twice before you buy such a deal.

I purposely refrain from discussing this problem further and leave the question as a famous novelist left the question—do you get the lady or the tiger?

ABSTRACT OF DISCUSSION.

H. J. Goeckel referred to a purchase by a druggist of a preparation in a large quantity, because of free goods and discount. Much of the purchase is still on his shelves.

P. Henry Utech asked for Mr. Philip's opinion on exchange of slow sellers for unknown goods. The author remarked that thereby the sale of the druggists' own preparations was cut down. A sale established on an unknown product may result in not being able to secure any more of the preparation, or only at a price which does not produce a profit. The former brought out the further point that stock on the shelf meant a gradual but interest-consuming investment. Chairman Hunsberger stated that an unknown preparation as bonus required an effort to sell the article by recommendation, a habit that ought to be discouraged.

PHARMACISTS IN POLITICS.

In a reply to a letter from Secretary J. G. Noh, of the Pennsylvania Pharmaceutical Association, in which request was made to Senator Pepper to give consideration to certain legislation in Congress, the Senator replied fully relative to the latter and closed his letter by saying that the Pennsylvania Pharmaceutical Association ought to be in politics as soon and as effectively as possible. His observation had led him to believe that the type of people that compose the Pennsylvania Pharmaceutical Association are of the type whose influence on public life is altogether wholesome, and that the opportunities carried with them responsibilities. He considered it was the duty of the members of the Association to make their influence felt on the side of wholesome legislation and diligent law enforcement.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

ALMOST EVERY DRUG STORE NEEDS A PROFESSIONAL BOOKKEEPER.

A plan by which a druggist's overdue accounts may be collected has been offered to druggists for some years. The basic idea of the plan is that the druggist sends a series of letters to his customers at regular intervals requesting payment of their overdue accounts. The letters are all supplied in printed form to the druggist. All he has to do is fill in on the letter the amount he is trying to collect and mail the letter.

So confident is the proprietor of this collection letter system of the efficacy of his plan that he offers it to druggists on the following basis: If the collection letters mailed as he directs do not bring in within a year's time overdue accounts to the extent of at least $300, the proprietor of this collection letter system will refund at that time the $50 for which he sells the system. The plan must prove profitable or the trial costs nothing.

The one restrictive feature upon this liberal free trial plan is this. The system will not be sold to a druggist who does not employ a bookkeeper. I asked, why? The salesman said, "After years of experimentation and trial we have learned that the druggist who, himself, attempts to keep his own books, simply will not send out the collection letters with the regularity and persistence which is necessary to collect overdue accounts. We know now that it is a waste of time to let a man who is attempting to do his own bookkeeping try out this collection plan. Sure as fate we'll have to refund his money at the end of a year; although this collection plan is simple and sure, he won't use it enough to collect a worthwhile amount of overdue accounts."

This is the mature opinion of a man who has spent years in contact with retail druggists. He knows from bitter experience that the druggist who is attempting to keep his own books does not and will not make any serious effort to collect outstanding accounts.

If a druggist will not take the trouble to try to collect the money which is owing him you can imagine the condition of the records of his own financial transactions. I am not attempting to draw up an indictment of the way a retail

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druggist runs his business. Most druggists who are lax in their bookkeeping methods will admit it freely. Furthermore, they will be far more critical of themselves for being so lax than any outsider would dare to be. The fault lies not with the individual druggist but with the nature of the drug business itself. Few druggists are so constituted that they can perform all their multifarious professional and business duties during the long hours they work and still have left the time, energy and inclination personally to take care of the endless detail required to maintain accurate, dependable bookkeeping records.

As I said before, no one denies that accurate bookkeeping records are very necessary but since the immediate necessity of doing the work required to maintain such records is not as pressing as the thousand other things a druggist must do to be successful, this bookkeeping work is what is slighted first, if the druggist is attempting to do it himself.

I have known druggists to become so enthusiastic about accurate records that they make the necessary investment in supplies and equipment to do their bookkeeping as it should be done and then let the whole thing stand idle month after month, simply because they don't have this very necessary time, energy and inclination to do the bookkeeping work.

Of course there are druggists who are so constituted that they can and successfully do keep their own bookkeeping records. However, the experience of the collection letter salesman just quoted confirms a widely held opinion that the druggists who are able and willing to keep their own books as they should be kept are so few and far between as to be almost negligible.

There is only one way to solve the problem successfully. Few stores are large enough to justify their employing a full-time bookkeeper. On the other hand, almost any store can use the part time services of a bookkeeper. For instance, one store doing a business of about $60,000 a year pays a woman $40 a month to keep a record of the income and expenses of the business and also to have entire charge of the billing and collection of the accounts of over 300 charge customers. She does all this work in three mornings a week.

Another druggist with two stores, but no charge accounts, pays a man $7 a week to keep a detailed record of the income and expenses of both stores. This man is able to do all the work required in three or four hours a week.

Still another store with 50 charge accounts and daily business of about $200 has its bookkeeping done for $5 a week. With the up-to-date methods used there, the bookkeeper can collate all the necessary information in 2 or 3 hours a week.

Another druggist who finds monthly statements of his progress sufficient for his purposes has all the work done for him in one day a month at a price of $12.

Thus it is apparent that in a drug store of moderate size the cost of maintaining accurate records is from $150 up to $500 a year. The question to be answered is, are accurate records worth what they cost? That is, are they worth the cost of bringing in someone from outside of the business to keep them? I believe it is perfectly apparent that, in most cases, it is not practical or advisable for a druggist to try to do the work himself.

One druggist will say "yes" enthusiastically to this question of the advisability of having a part-time bookkeeper. The first year he employed a man for this work he has checked no less than 17 times when he began to overbuy. Im-

agine the effect upon turnover and profits if he had bought as he most certainly would have bought these 17 times had not the weekly reports of the bookkeeper pointed out to him, in time, this dangerous tendency. That year for the first time profits commenced to flow into his pocket instead of into the basement in the form of huge quantities of dead and unsalable stock.

Six months after another druggist installed a bookkeeper the amount of overdue accounts had been reduced from over $1000 to less than $200.

When the books which one druggist kept himself were audited over $2000 in income was found, the loss or expenditure of which could not be traced. The next year untraceable shortages of cash were reduced to less than $10, simply because everyone in the store realized now that the new bookkeeper was keeping accurate up-to-the-minute records of income and expenses and any discrepancies would be discovered at once. His accuracy compelled everyone else to be careful and accurate.

These are only a few of thousands of instances that could be cited of the way in which accurate, up-to-the-minute records protect and increase profits.

One druggist, who has been in business more than 30 years, told me frankly one day that he never made any money until he began to have some one come in to keep his books.

There is no denying that accurate, up-to-date records cost money to install and maintain, but the experience of those who do incur this expense proves the fact that the resulting protection and profit is worth far more than the cost.

TOO MUCH DETAIL IS SOMETIMES A BARRIER TO PROGRESS.

The old saying that "Details make perfection but perfection is no detail," has no more significant application than in the retail drug business. To a person in the business the truth of this saying is apparent many times a day.

The importance of details is apt to impress itself so forcefully upon the druggist that he begins to believe that the one way to insure these all-important details being taken care of, as they should be, is to do them all himself. That is a fatal error. A proprietor may believe, and believe quite truthfully, that he can wash windows better than any porter who ever lived. However, if he uses precious energy in washing windows that means he has just that much less energy to do things equally important which no one else in the store could possibly do.

I have seen a druggist with a positive genius at display industriously open cases of newly arrived merchandise in the back room of the store while in the store itself an extremely valuable counter display stood vacant for days at a time, because the proprietor was "too busy" to think of something to put there. The druggist should use his precious time and energy in the way that, for him, will count the most. Men whose special abilities are in personal selling do best to devote their major efforts there, retaining only a general supervision of the other necessary activities of the business. Others have unusual acumen in buying or in financial matters. Still others are especially able to train others.

The point is that when a store grows to any size at all the proprietor can't possibly do all the work himself. The question is, what should he delegate to

others? Two factors govern. The proprietor should not do work which can be performed just as satisfactorily by less experienced or less costly help. For instance, no matter how able a soda fountain dispenser a druggist might be, he would be better off financially if he hired somebody at half or two-thirds his earning capacity to do the work for him.

The other consideration which controls when a proprietor begins to delegate duties is this. Each individual has strong qualities and weak ones. The proprietor can strengthen his power and influence if he delegates to others those duties which he himself cannot perform as well as some of his assistants. A man who is a genius at window display or writing advertisements does well to perform this important work himself and let his assistants do the work for which they have special talent. The responsibility of proprietorship is to see that assistants do the work that is expected of them as it should be done.

SEASONAL DISPLAYS FOR FEBRUARY AND MARCH.

Chest protectors	Face creams, lotions and powders
Atomizers	Olive oil
Sick room supplies	Cod-liver oil
Medicinal and toilet soaps	Telephone orders
Shampoos and hair tonics	Easter perfumes and toilet waters

DRUG-STORE OWNERSHIP.

The *Rocky Mountain Druggist* presents a number of interesting reasons for amending the Colorado pharmacy law. One of the amendments relates to drug-store ownership and the use of the name drug store or pharmacy by those not entitled to the distinction. In States where such legislation is contemplated it might be well to investigate and present examples from actual life of conditions that obtain in order to bring out the dangers and persuade the legislatures to favorably consider enactments regulating not only the ownership of stores but also the misuse of terms designating the establishments, other than drug stores, selling poisons and medicines.

An example cited is the following: A Denver doctor had attended a patient in a small nearby town in which there were two places, supposedly drug stores; both having signs to that effect. The prescription was left by the doctor in the store where there was no qualified pharmacist.

A drug store (?) was investigated by a member of the Board of Pharmacy. The owner admitted that he was not a registered pharmacist, but that no poisons were sold in the store. The Board member noticed tinctures of aconite, belladonna, digitalis, etc., on the shelves and the proprietor's attention was called to this. He did not know that these preparations were poisons.

A druggist doing a "boot-legging" business told the Board member that there was no law which would prohibit him from using the drug-store sign. He would have continued the drug store if it had not been for the fact that the revenue law caused him to desist. Other examples are cited and all of them should prove of value in promoting laws restricting drug-store signs to establishments conducted by registered pharmacists.

MEDICAL ADDRESSES BEFORE LAY AUDIENCES.

The *Journal of the Indiana Medical Association*, for December, states editorially that medical addresses to laymen should be given in laymen's language. The comment explains that very often medical men who speak before such audiences on health subjects are not understood because the speaker's language goes over the heads of the average person. Attention is called by the publication referred to, as in the opinion of its editor medical speakers at luncheon clubs and public conventions should be advised to prepare their addresses so as to inform and interest the listeners.

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

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AN INTERESTING AND VALUABLE STATE BOARD REPORT. (MICHIGAN.)

The annual report of the activities of the Michigan Board of Pharmacy (for fiscal year ending June 30, 1926) has just been received, stating that, during the year, 481 candidates took the examinations for full registration and 94 were successful; 397 took the assistant examination and 243 were successful in obtaining assistant's certificate. Fifty-five candidates were admitted by reciprocity, and 35 Michigan pharmacists reciprocated with other states; 2268 licensed drug stores are registered with the state.

A State Drug Laboratory is maintained at which drugs taken by inspectors from wholesalers, manufacturers and retail stores are tested as to their conformity with the required standards. The résumé of the findings on various drugs tested by M. M. Woodward, State Drug Analyst, is, we believe, of general interest:

It is stated that analyses of potent tinctures bear out previous warnings that tinctures should not be made up from fluidextracts. The account explains that while reports of analyses have shown a very low percentage of preparations up to standard, this must not be considered a true average condition, for the reason that samples taken by inspectors are largely from sources where complaints have arisen as to their quality or reliability. In fact, the report goes on to say, very satisfactory improvement has been noted over last year's report with one exception—tincture of aconite.

With reference to aconite, the report states that while chemical assays of samples of this drug may show it to be up to standard, the activity of the drug as demonstrated by the present official biological assay is often far below standard.

There is reason to believe, therefore, the report continues, that the "unprecedented number of sub-standard samples of tincture of aconite" is due to hydrolysis of the aconitine and that the hydrolysis is caused by aging and its rate is materially increased by the manipulation given the fluidextract in preparing a tincture

from it. The report promises that this matter will be further investigated and reported upon.

Relative to Tincture of Belladonna, it is stated that it is clear that many of the samples of this tincture taken by inspectors were made from the belladonna root, or what is more likely, from fluidextract of belladonna root. Attention is called to the fact that the U. S. P. only recognizes the tincture made from the leaves, and that fluidextracts of both leaves and the root are official. Attention is also called to the further fact that the fluidextract made from the root is one-third stronger than that made from the leaves, and that, therefore, a tincture made from the fluidextract of belladonna root will be one-third too strong, and of brown color instead of green—the natural color of the leaves. The report warns as follows:

"Because the tincture of belladonna is a very potent medicine and much used, it is important that pharmacists clearly understand the difference."

Mr. Woodward makes several timely warnings against the use of other than U. S. P. standard drugs in the preparation of official pharmaceuticals. In warning against the use of artificial oil of peppermint, which he says is now on the market at a considerably lower price than the true oil, he points out that the artificial oil is made from synthetic menthol, which is optically inactive while natural menthol is strongly levorotatory. Another reason given why the artificial oil should not be used in making official preparations is the fact that the 50% of the true oil, not menthol, is a complex mixture which it is at present impossible to imitate closely.

Mr. Woodward also warns strongly against the "reprehensible practice" of using denatured alcohol in the manufacture of medicinal preparations, emphasizing the fact that when a preparation or a prescription calls for alcohol—"pure U. S. P. ethyl alcohol and not alcohol containing any foreign substances," is meant.

Relative to U. S. P. spirit of nitrous ether, Mr. Woodward reports as follows: "Although U. S. P. sweet spirit of nitre has been given the widest attention and most comprehensive research into ways and means of producing and keeping it up to standard, it still remains one of the most persistent and flagrant violators of the drug laws."

Mr. Woodward then points out that in spite of the fact that the U. S. P. directs that this preparation shall be preserved in small, well-stoppered, dark amber-colored bottles, in a cool, dark place, etc., inspectors continually report that this preparation is kept by pharmacists in so-called stock bottles ranging from a pint to a gallon in size, the majority of these being of white glass, kept on high, warm shelves where strong light has access to them.—"Yet some of those druggists cannot understand why their preparations are found to be below standard."

Mr. Woodward has included in the report many other timely warnings and useful hints to pharmacists. In one article entitled, "The Fine Points of a Weighty Subject," he states that too large a per cent of weights used by pharmacists are not standard, and he makes many useful suggestions regarding the importance of accurate weights, their proper handling, cleaning, etc.

Another article is entitled "Drug Labels I Have Known." In this article Mr. Woodward mentions many errors and inconsistencies of labels in general use by pharmacists and closes with the following:

"It is not the purpose of this article to give details as to the correct labeling of

the various commodities. Suffice it to say all labels, besides showing distinction, honor and correctness of information, should also conform to the laws of the land concerning the particular product. That is, poisons should be so labeled and the printing should be in red ink. The percentage of alcohol should be stated and the presence of certain substances as acetanilid, chloroform, etc., should be declared in accordance with State and federal laws."

H. H. Hoffman, Director, wrote the introduction to the report—an outline of the Board of Pharmacy's part in safeguarding public health. This gives a brief but comprehensive statement of the laws which are being enforced, and the duties of the Board of Pharmacy. It shows receipts of $37,793.50 in the year ending June 30, 1926 as against $7500.00 in the year ending June 30, 1921. These figures not only show a wonderful increase in revenue, but make it clear that the work which the Board is doing is of increasing importance to the welfare of the public, as well as raising the standard of pharmacy in the State. By its work, as covered in this very comprehensive report, Michigan is setting an example which, if followed by every other State, would reflect great credit on pharmacy as a profession in the safeguarding of public health.—H. C. C.

GENERAL NEWS ITEMS.

A legislative measure directed against illegal liquor-vending drug stores was approved by the Missouri Board of Pharmacy at a recent meeting in Kansas City and is to be introduced at the present session of the Legislature.

This proposed law would require a permit for each store operating, and permits would be issued only to stores owned or managed by a registered pharmacist. It also proposes to open all drug stores to inspection by the Board, thus making detection of violations easier. The punishment for violation would be a jail sentence or a fine, and each week of violation would constitute a separate offense.

N. G. Edelblute, of Topeka, President of the Kansas Board, was recently held up while going from his store to his home, a distance of less than a block, and forced to return to the store, unlock the safe, and give the thieves $280.00 in cash.

Dr. H. E. Kalusowski, Dean of the Pharmacy Department of George Washington University, passed away very suddenly January 9, 1927. Just the night before, he had been talking to A. C. Taylor, N. A. B. P. Vice-President and Chairman of District No. 2, regarding representation from the colleges at the district meeting, soon to be held. The George Washington University will long miss this ardent worker for the cause of pharmacy.

LEGISLATION AGAINST THE CHAIN STORE.

A bill which aims to restrict the discriminatory practices of chain stores, in the interest of public welfare and as a protection for the small store interests, is being prepared by attorneys in Pennsylvania for introduction into the legislature of that State, according to an account published in the *Wilkes-Barre Telegram* under date of December 5, 1926.

In commenting on this proposed bill, the *Telegram* states in part as follows:

"The very question that the Sherman law settled is involved in the chain store proposition. It is the protection of the small interests from the criminal and discriminatory encroachment by the large interests. . .The Sherman act covered the situation and the belief prevails that the bill now in the making at Harrisburg will have a similar effect on the destructive chain store proposition. . .The bill to be introduced at Harrisburg is not designed to destroy the chain stores. That cannot be done through legislation. It is designed, however, to break up the nefarious and un-American practice of allowing chain stores to discriminate in their prices."

Later reports are to the effect that the bill has been introduced. While this bill is being sponsored by the independent grocers, it would seem to be of equal interest to the druggists.—H. C. C.

STATE BOARD OF PHARMACY NEWS ITEMS.

Connecticut.—Report of the November meeting held at Hartford shows that four out of the sixteen candidates taking the examination for registration as pharmacist were successful.

District of Columbia.—The final report on the October examination shows 45 candidates taking the examination, of which number 12 passed and received certificates and 33 failed.

Idaho.—The Department of Law Enforcement, Bureau of Licenses, reports that all of the six candidates taking the January examination for registration as pharmacist were successful. The one candidate taking examination for registration as an assistant was also successful. Reciprocal registration was granted to Lynn L. Davis, John F. Bradshaw and Allen H. Hoag, of Washington; F. L. Christenson and Frank J. Golden, of Oregon; Arthur C. Dring, of Missouri; Maurice B. Conrad, of Illinois.

Examination dates for future meetings have been changed from the first Tuesday in January and July to the third Tuesday in the same months.

Illinois.—At the meeting held January 18th to 21st inclusive, 128 applicants appeared for examination for full registration, and 42 for assistant registration; 20 candidates applied for reciprocal registration and a list of the names of those granted registration will be supplied for publication later.

Indiana.—At the examination meeting of the Board held on January 10th, 11th, 12th and 13th—41 applicants appeared for examination and registration as pharmacist, and 20 for assistant registration. Results of examinations will be reported later. Reciprocal registration was granted to the following: Fred J. Frison, of Illinois; W. W. McNamara, of Montana; Cloid V. Carmichael, of Iowa; Harold S. Coates, of Michigan; Harry G. Carney, of West Virginia.

Kansas.—The State Association members and the Board of Pharmacy are doing all that they can to defeat the proposed consolidation bill, which would place all the various boards into one large department under one executive. To put a professional board on a commercial basis is not conducive to a betterment of the profession and its code of ethics. It is hoped that Kansas will succeed in blocking and defeating this measure.

The annual inspection of drug and other stores selling patent medicines will be completed some time in February.

The next examination meeting will be held February 2nd and 3rd at Wichita.

Kentucky.—Of the 23 applicants taking the January examination at Covington, 19 were college graduates and 4 were re-taking the examination who were eligible as non-graduates. Of this total number, five candidates were successful, four being college graduates and one a non-graduate. Six applicants took examination for the assistant certificate and five of them were successful. Reciprocal registration was granted to Chas. A. Schwaninger, Thomas A. Bramble and Raymond F. Doherty, all of Indiana.

The next examination meeting will be held in Paducah on April 12th.

Maine.—The Board held an examination meeting at Augusta on December 8th. Ten candidates were examined, out of which number 3 passed the examination successfully and were granted registration as pharmacists.

Massachusetts.—Twenty-one candidates out of a class of 63 have been granted registration as pharmacist as a result of the November examination.

Minnesota.—The annual meeting of the Board was held on January 10th. Edwin A. Brown of Winona was elected President of the Board and John W. Dargavel of Minneapolis, Secretary.

Forty-four candidates took the January examination, 20 of whom were graduates and 24 non-graduates; 28 of this total were successful in passing, 17 being graduates and 11 non-graduates. Fifty-two candidates took the assistant examination and 20 of this number passed.

Reciprocal registration was granted to Eva R. Hansen of South Dakota, and Philip R. Nelson and Donald M. Christianson, both of North Dakota.

Mississippi.—There seems to be a general tendency among the pharmacists of the State to have the present law amended or rewritten to more fully embody the principles laid down in the model law, such as annual re-registration, a registration of stores, etc.

It is probable that a draft will be made of the proposed changes and submitted to the State Association in June for approval by the membership, after which it will be corrected and placed in the hands of the Legislative Committee for presentation to the legislature in 1928.

Joe J. Gerashe, Jr., of Vicksburg, has been appointed by the Governor to fill the unexpired term of J. D. Harpole, deceased.

Five of the six applicants taking the January examination, all graduates, were successful, and have been issued certificates.

Nebraska.—Robert A. Hardt, of Hastings, has resigned as Secretary of the Nebraska Board of Pharmacy and accepted a position with E. R. Squibb & Sons. Guy Butler, of the Butler Drug Co., of Lincoln, has been appointed by the Governor to fill the unexpired term of Mr. Hardt as a Board member.

New Mexico.—The next examination meeting has been called for May 26th and 27th.

Pennsylvania.—The final report on the October examination shows that pharmacist certificates were issued to eighty-two out of two hundred and sixty-three taking examination. All candidates are graduates of a recognized school of pharmacy. Fifty-six assistant pharmacists passed the examination given to one hundred and nineteen, and this grade of certificate has been issued to the successful ones.

Reciprocal registration has recently been granted to Aram P. Oski, of Massachusetts; Gale Satterlee, of Illinois; Harold L. Schryver and Roy B. Thomas, of Ohio; Robert I. Stagmer, of New Jersey.

South Carolina.—The next examination meeting of the Board will be held on March 16th at Columbia.

South Dakota.—Several amendments to the present pharmacy law have been prepared by the Executive Committee of the State Association and have been introduced in the legislature and have received the approval of the Committee on Drugs and Food.

These amendments include a prerequisite or college graduate requirement, together with law definitions of the terms drug store, pharmacy, medicine, poison, etc.

The next meeting of the Board will be held at Brookings, June 7th and 8th.

Virginia.—A special session of the Legislature will meet in spring, possibly about April 1st, to consider a re-organization of the various State departments of government. A bill consolidating the pharmacy, medical, dental and other State Boards probably will be introduced.

The next examination meeting of the Board will be held on April 25th.

Washington.—An examination in which 100% of the candidates were college graduates and successful in passing is the record established at the January meeting, the number of candidates being three.

Reciprocal registration was granted to Edgar H. Johnson, of Minnesota; James Leslie Shaw, of Oregon; Jay H. Allison, of Montana.

Wisconsin.—Eighteen out of 52 candidates taking the January examination were successful and have been granted certificates as registered pharmacists. Assistant certificates were granted to 21 out of 50 taking that examination.

Reciprocal registration was granted to Earl M. Jenson, of Pennsylvania.

The next examination will be held in Madison on April 18th.

DISTRICT MEETINGS.

Hugo O. Peterson—N. A. B. P. Vice-President and Chairman of District No. 4 including Iowa, Minnesota, Nebraska, North and South Dakota—has completed arrangements for a meeting of that district to be held in St. Paul, Minn., on Wednes-

day, February 9th, during the week of the Great Northwest Drug Show and the forty-third annual meeting of the Minnesota State Pharmaceutical Association. All State Boards of the district are expected to send delegates. Several of the schools and colleges of pharmacy of the district also will be represented.

The following program for the meeting has been announced:

1. Address by Vice-President Hugo O. Peterson.
2. Report by National Secretary H. C. Christensen.
3. Report of various State Boards.
4. Discussion on advances and reciprocity.
5. The method of conducting examinations in the different Northwest States. Reports by delegates followed by discussions.
6. Desirable changes in State pharmacy laws relating to Pharmacy Board activities—discussions.
7. Pharmacy inspectors and enforcement problems—discussion.
8. Formulation of recommendations for national associations.

Progress is being made with arrangements for meetings in Districts 2, 5, 6, and 7 to be held some time during March or April.—H. C. C.

THE WELLCOME HISTORICAL MEDICAL MUSEUM.

The Wellcome Historical Medical Museum (London) was founded by our fellow member Henry S. Wellcome in 1913. Among the collections are the following:

"An English alchemical manufacturing laboratory of the sixteenth century. This reconstructed laboratory is one such as Paracelsus might have used. Mysterious, gloomy, dark, with strange animals and fish depending from the roof, casting fantastic and eerie shadows on the old stone walls, it offers a glimpse of the surroundings of the worker in science some four centuries ago. Most of the equipment in this laboratory was in use in England for the production of medicaments until quite recently.

"A London chemist's shop, eighteenth century. The shop front is the original of the pharmacy established in 1798 by John Bell, father of Jacob Bell, founder of the Pharmaceutical Society. The vases and ewers in the interior are of old Davenport ware, the ointment jars of Staffordshire stoneware, and the essence bottles of early red Bohemian glass. The laboratory in the rear contains the original ancient fittings of a pharmaceutical laboratory of the eighteenth century that once stood in Russell Street, Covent Garden, London. The preliminary discussions regarding the formation of the Pharmaceutical Society took place in this building.

"Apothecary's shop, 1625.

"Italian pharmacy, sixteenth century.

"A barber-surgeon's shop, sixteenth century.

"Native model of a Chinese drug shop.

"An original Turkish drug shop of the seventeenth century, transferred from the old drug bazaar in Constantinople and reconstructed in the museum.

"In various cases are copies of Hortus Siccus and early herbals; Terra sigillata and the history of this ancient medicament from 100 B. C., together with specimens of the 'Sealed-Earth' of various kinds used in different parts of Europe; Theriaca; rare and curious drugs, including Bezoar stones, eye stones, Chinese ginseng-root, poison sucking stones and drugs used by native witch-doctors; curious specimens of jalap, having a natural resemblance to birds, animals and reptiles; specimens of drugs showing adulteration; ancient Egyptian drugs excavated from a grave, 1500 B. C.; mandrake roots; medicine chests and cases; pill-making apparatus and Delft slabs; ancient pharmaceutical apparatus, etc.; barbers' bowls and basins; hot water bottles; funnels, etc."

INFLUENZA EPIDEMIC IN EUROPE SPREADING.

The epidemic of influenza in southern England is abating, but is spreading to the midland, and also is gaining a foothold in Sweden, Finland, Czechoslovakia, Bulgaria and Macedonia, according to a cable received by the United States Public Health Service from the Health Organization of the League of Nations at Geneva, and made public February 8th.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

COLLEGE PREPARATION VERSUS BOARD EXAMINATIONS.

BY ZADA M. COOPER.*

For several years there has been a great deal said about the necessity of faculties of colleges and boards of pharmacy getting together and understanding each other's tasks better, if the percentage of failures among college graduates taking board examinations is to be reduced to what seems reasonable. Though this anomalous condition does not exist in every State it does exist in all too many and board members and teachers alike concede that something is wrong.

Conferences of individual boards and members of faculties of the colleges in that State, first suggested, I believe, by Dr. R. P. Fischelis, at the joint session of the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy at the Buffalo meeting and by others at each succeeding meeting, is a splendid idea. Such conferences can be productive of nothing but good.

As I read the minutes of the joint session of the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy at the Philadelphia meeting last fall, one thought recurred over and over, and that persistence is the reason for this article.

One of the questions discussed at the session was "To what extent shall correlation of schools and boards exist?" and many splendid ideas were presented and those of us who heard that discussion will profit by those ideas. In writing an abstract of that discussion for use in the printed Proceedings of the Association, in endeavoring to get and to express the point of view of each speaker, regardless of my own opinion in the matter, this same thought was constantly in my mind. The questions which came to me may not have come to others—perhaps what was meant was perfectly plain to everybody else, perhaps all I need is a good dictionary. However that may be, I wish to present my thought with the hope that, if it is worth anything, someone or several will take up my question and answer it.

It is this: that an analysis should be made of the types of questions candidates fail to answer. I know that compiling statistics involves a lot of work, but I can think of nothing that would help us, who teach, so much as to know the questions that are answered incorrectly, to have them grouped and to have figures on the percentages who fail to answer. For instance, one of the subjects I teach is pharmaceutical arithmetic; the fatalities are always high and I have only a vague idea as to why, and that idea was obtained from what candidates have told me after taking the examinations. Sometimes I do not even know what is considered right and what wrong. Now, I can hear some one saying right is right and wrong is wrong, and I agree perfectly, but let me illustrate. There is the much disputed percentage solution question. Those who teach arithmetic and, probably, many others know that there are several ways of going about the calculation of amounts required for percentage solutions—several ways that give abso-

* State University of Iowa.

lutely correct results and some that are approximately correct, "correct enough for practical purposes," I am sometimes told. Do I know which way or whether all ways will be given credit? I do not, and I'll venture to say that there are other teachers of pharmaceutical arithmetic who could testify to the same lack of information, if they cared to. But there are a lot of subjects upon which we know much less than we do about arithmetic, subjects more truly applicable to my original thought—of our needing to know the *kind* of questions our graduates fail to answer. Is it official Latin titles, is it doses, is it synonyms, is it the medicinal action, or is it something else? Just what sort of thing is it that stands out?

Going back for a moment to the discussion at the last joint session, to which I have already referred, one speaker said that the reason why these graduates of universities cannot "pass very simple examinations" is that members of boards and members of faculties have entirely different viewpoints, that our class-room work is presented from an entirely theoretical standpoint, while men who serve on boards of pharmacy are practical retail men who prepare their questions from the standpoint of the store. Unfortunately for me, he gave no illustrations. Just what he meant may be perfectly obvious to everybody else, but I must confess it wasn't to me. As a generalization it was perfectly lucid, but as a demonstration of why my questions are high-brow, theoretical, impractical, it was about as transparent as the Missouri River. Another speaker said that boards are trying to determine—not how well a candidate has been *educated*, but how well he has been *trained;* that candidates are failing, because they have not been properly trained in the technical side of pharmacy. "Boards," he said, "still recognize the necessity for practical training." Here again I need elucidation of "technical pharmacy" and "practical training."

Reiterating what I said in the beginning, if members of boards could find the time to classify the questions which students fail to answer and to report on the percentage of failures we, who teach, could decide for ourselves whether we are "theoretical" at the expense of the "practical" and just what is meant by "practical training in technical pharmacy." Or, we would gladly make our own classification if the questions which large numbers of students fail to answer could be supplied through the pharmaceutical press, or otherwise.

Very closely associated with this question of the *sort* of thing that students are failing to answer is another that this analysis or classification of questions which I am proposing would illuminate. I refer to the comparative value of store experience in teaching the things that boards are asking. For the most part, a simple reading of a question tells at once whether the correct answer is learned in a store or a class room.

Let no one for a moment infer that I think store experience is valueless. Every teacher knows that the things our graduates have to learn in a store are almost infinite in number, but we wonder how many of these things help in passing board examinations. Before an individual can be worth very much to a proprietor he has to learn many things, especially about the conduct of a pharmacy, with all that it involves, but if those self-same things are not being asked in examinations most of the reason for the law of most States, not permitting board examinations to be taken immediately after graduation, would go aglimmering. If that were shown to be true it would shed considerable light on a very much

disputed question. In view of the fact that a paragraph of Article II of the By-laws of the National Association of Boards of Pharmacy, which has to do with reciprocal registration, says that "an applicant must have passed an examination at least in pharmacy, chemistry, materia medica, pharmaceutical and chemical mathematics and practical work," and with the further evidence to be obtained from published lists of questions of various State Boards, it seems to be a perfectly logical conclusion that very few questions are being asked of candidates, the answers to which are learned in stores. Statistics about questions which students fail to answer would refute or prove this. There might still be ample reason for withholding the certificate of registration until the store experience had been completed, but there would be no reason for deferring the time of taking the examination—a requirement which makes candidates complain rather bitterly—because they know that in medicine, a man takes his examination at the end of his college training, but his certificate is withheld until his interneship has been served. Furthermore, it puts a premium upon dishonesty.

Is it not possible, then, to have a sufficient number of these questions which students fail to answer published, or some statistical information given about the *type* of questions (if there is objection to publicity for the questions themselves), so that we can modify our teaching accordingly? It is rather heartrending to see this "slaughter of the innocents" go on, when we who teach would gladly remedy it, if it is our fault. It all has a bad effect upon pharmacy as a calling, aside from these personal phases.

To my mind, no greater service could be rendered than to bring about an understanding of this matter.

LEADERSHIP THAT DOES NOT LEAD.

BY WORTLEY F. RUDD.

Disillusionment it seems is at least a part of the price we must pay for whatever of wisdom may come to us as we grow older. The story books of our youth built up as they were around heroes that always did right and incidents that turned out as we wanted them to do naturally gave us a fine idealism. This is as it should be. Without such a spirit youth would neither dream nor dare and both of these are manifestly necessary to progress. Fortunately too we give up our idealism slowly, so slowly in fact that most men have enough to furnish some degree of motivization even to the end. We can name almost in chronological order when our idols were broken. First the fairies went, then Santa Claus and the stork. These were shocks, each of them leaving us wondering what would be the next to go. And too, we began early to have our heroes in actual life, men and women, boys and girls, selected from the crowd and set apart as different, better, smarter, truer; it is just human nature to be hero worshipers and we all are more or less. Our heroes too go, not all, but many of them, and in middle life most men and women probably have very few left in this class. This too is as it should be for comparatively few are made of the stuff that we demand in those whom we would thus continue to honor. I venture, however, to say that there is not one who cannot name a few men and women in whom are all the qualities

that make real leaders but who have either failed to lead or have sold their leadership for a mess of pothage. There are so few men and women capable of doing the large constructive thinking and work of the world that the spectacle of one who is richly endowed with personal magnetism, keen intelligence and ripe judgment prostituting such an endowment, leaving the important things to be done by men of small calibre, impresses us as a breach of trust unequaled in the whole category of transgressions.

I am constrained to believe that education has suffered fearfully from just such prostitution of natural endowment. The gifted leader or educational administrator, unless impelled by a spirit of complete dedication to the training of young men and women, has allurements that must be hard to refuse. The most important task in all of our complicated civilization is thus frequently left in the hands of the mediocre.

What we started out to say was that only too often men and women gifted by nature and who might easily lead in the large things of life allow themselves to be sidetracked into leadership of minor consequence or even fail to lead at all, You know some of them; so do I. They are among the great tragedies of life because they have not "chosen the better part."

NATIONAL PHARMACY WEEK.

The *Purdue Pharmacist*, of November, published an address by E. E. Goodnight given over the radio during National Pharmacy Week on "Professionalism in Pharmacy," a very timely address in the language of the laymen.

Under direction of Prof. Charles O. Lee a number of the students aided in making displays in the windows of a number of pharmacies in Lafayette, as part of their school work. All these windows gave publicity to the professional side of pharmacy and of different types. In one, prescriptions were used as a basis; in another, products and sources of supply of medicines; in another, processes of pharmaceutical manufacture displays, books, etc.

AMPULS HELD TO BE DUTIABLE AS VIALS.

In a case of the United States against Eli Lilly & Co. and Parke, Davis & Co., decided on January 21, 1927, glass ampuls were declared dutiable at 50¢ per gross for vials holding less than 1/4 pint, by U. S. Court of Customs Appeals, in its decision on the Government's appeal in the case mentioned. The importers had protested the classification claiming that ampuls were dutiable at the rate of 55% *ad valorem*, which claim was sustained by the Board of General Appraisers. This definition, however, was reversed in the opinion cited above.

In the case mentioned definitions of the following dictionaries were referred to:

"Webster's New International Dictionary," 1925, defines ampul as a small bottle, a phial; and vial as a small vessel for liquids; now usually a small glass bottle as, for medicines or chemicals, a phial.

The "New Standard Dictionary" defines a vial as a small vessel commonly of glass and cylindrical, narrow, uniform and in proportion to its height, fitted with the mouth to be closed with a stopper and intended to hold liquids, especially liquid medicines.

"The Century Dictionary" defines ampul as a vessel or bottle, especially a small glass bottle used for holding liquids and particularly liquid medicines.

The new "English Dictionary" defines ampul as a small bottle or flask, a phial.

While the definitions in a general way may be applicable, still it seems that these are rather general and the suggestion is made that a more specific definition be prepared for "ampul." An automobile and an elevator differ as much as a clock and a watch, a s an ampul and a vial.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

Article IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

BALTIMORE.

The January meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Hotel Emerson on January 12, 1927, President R. L. Swain in the chair.

Theodore J. Bradley, Dean of the Massachusetts College of Pharmacy, and President of the AMERICAN PHARMACEUTICAL ASSOCIATION, was the honored guest of the evening, the members of the Baltimore Branch being the third group which President Bradley addressed in his "Chautauqua circle swing" from Boston to Baltimore. In his sincere and friendly manner he explained the history of the selection of his topic—"Legislation and the Pharmacist" and expressed pleasure at being able to present the subject in Baltimore. The speaker referred to divisions of Government—judicial, executive and legislative—and expressed the opinion that the legislative powers were the powers most generally abused or misused.

He enumerated the objects of legislation: (1) *Constructive*, evidenced by public works, the conservation of natural resources, development of agriculture, etc., and stated that this would be the only kind of legislation needed if it were not necessary to regulate the conduct of people; (2) *Punitive*, which took the place of individual revenge, the principal motive of which is now to make the punishment commensurate with the crime; (3) *Regulatory*, concerning things which one must or must not do, some of which have recently, on account of regulations by enforcing officers, become tedious and irksome to the pharmacists. He noted that the work of reformers, although idealistic, was often unscrupulous and that they sometimes held the balance of power mainly because lawmakers will not vote against popular measures based on moral issues. He pointed out that in some instances efforts to regulate the sale of narcotics, etc., had resulted in advertising the articles, rather than diminishing their use.

President Bradley stated that it was foolish to offer a panacea for these ills, but urged that pharmacists be missionaries in the development of public opinion, and suggested the use of constructive education rather than legislation and regulation. He also recommended the increased ability to use the primary system, and the searching of their records before selecting men for advancement.

Mrs. Charles E. McCormick pleasingly and graciously rendered several well-selected vocal solos.

The annual election resulted in the following officers and committees for 1927:

President, L. M. Kantner, 700 W. North Ave., Baltimore, Md.

Vice-President, Frank L. Black, 2839 W. North Ave., Baltimore, Md.

Secretary-Treasurer, B. Olive Cole, Greene & Lombard Sts., Baltimore, Md.

Committee on Membership: Charles C. Neal, *Chairman;* L. S. Williams, Aquilla Jackson.

Committee on Professional Relations: Charles L. Meyer, *Chairman;* E. G. Eberle, John S. Donnet.

Committee on the Science and Practice of Pharmacy: John C. Krantz, Jr., *Chairman;* H. E. Wich, Wilmer H. Schulze.

Committee on Education and Legislation: R. L. Swain, *Chairman;* A. G. DuMez, E. F. Kelly.

B. OLIVE COLE, *Secretary.*

CHICAGO.

The 162nd meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Friday evening, December 10th, with a very large attendance of members and friends. It was the social night for the Branch and a reception was extended to members received during the year.

The Lambda Kappa Sigma Sorority splendidly presented a play entitled "A Bit of Scandal." The College of Pharmacy orchestra provided splendid music. After the play refreshments were served and dancing in the college halls prevailed until midnight. Great excitement followed the nearly successful attempt of the "Frat" boys to steal the ice cream.

JANUARY.

The 163rd meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Friday evening, January 14th, at the School of Pharmacy Building, 701 S. Wood St., with President Kolb in the chair. More than 100 were present at the meeting.

Dean Edward H. Kraus, of the University of Michigan College of Pharmacy, delivered a splendid address on "Recent Changes in Higher Education in Europe." Dr. Kraus is a keen observer and a splendid speaker and his talk, based on a recent study of the subject during a four months' trip in Europe, was highly appreciated. He dwelt especially on the educational changes in connection with the health professions but brought out in a general way the effect of American influence on European methods. This "Americanization" is bringing about a very marked change toward democracy in the higher institutions of learning. He indicated the extent of European study of American institutions and methods and solemnly called attention to the effect that the adoption of American methods by European nations will have on world trade in the near future. American education having as its basic principle the education of all the people, the American manufacturing principle of mass production and the American commercial principle of advertising have placed America at the head of the nations. She must steadily strive to maintain this place.

E. N. GATHERCOAL, *Secretary.*

DETROIT.

The January meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Friday, the 14th.

Dinner was served at Webster Hall and the meeting was held at College of the City of Detroit. The new headquarters of the Wayne County Medical Society, in the New Maccabee Building, not being ready, necessitated the last minute change in the meeting place. Mr. Lakey took the members on a tour of inspection through the College of Pharmacy.

After waiting some time for the speaker of the evening, Dr. Jacoby, who did not arrive, President Rowe called the meeting to order. The minutes of the previous meeting were read by the Secretary and approved.

Chairman Lakey of the Program Committee outlined his plans of the meetings for the remainder of the year; he called attention particularly to the April meeting which will be clerks' night.

Mr. Chase reported that the resolution of the Branch regarding the Health Exhibit, to be held in conjunction with the World's Fair at Chicago, had been placed before the Council for action.

In the absence of a speaker, Leonard A. Seltzer volunteered to pinch hit for Dr. Jacoby. Mr. Seltzer read a very interesting paper for the betterment of annual meetings of the A. PH. A. His paper was full of facts showing how the meetings are permitted to drag because of the many unnecessary delays, due to the programs not starting on scheduled time. He said this was gradually creating a feeling of unrest among those in attendance and a satisfactory remedy ought to be found to correct this condition.

A general discussion followed in which many of the old timers who have been attending these meetings for many years joined.

Mr. Rowe thanked Mr. Seltzer for coming to the rescue in the absence of a speaker and for his most interesting paper. It was requested that Mr. Seltzer's paper be printed in the JOURNAL in conjunction with the minutes of the January meeting.

BERNARD A. BIALK, *Secretary.*

FIRST AID WEEK.

The week of March 13th has been designated "First Aid Week." The displays should be in accord with the name and affords the opportunity of informing the public that "the Druggist is more than a Merchant." The windows should be used to invite the patrons, and the interior should emphasize the message pharmacy.

DISCUSSION OF THE CONDUCT OF OUR PROGRAM AT AN ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

By Leonard A. Seltzer.

To those who have attended the annual meetings of our ASSOCIATION for a considerable number of years, the increased complexity of the program has become very evident; it is equally evident that the corresponding demands which these conditions have brought about have not been successfully met; for not only have the number of sections been increased, not only has the program been lengthened, not only has there been a greater number in attendance, but we have succumbed to the tendency to use our available time less economically than formerly. For not only has the number of days over which the program is spread been lessened, but much of the time is lost in unfortunate and unnecessary delays, because instead of beginning on Monday as formerly, we begin as late as Wednesday, and instead of calling sessions on schedule time, begin them one-half to one hour later. Those responsible for the meeting do not realize the feeling of unrest gradually developing among the attendents as the meeting progresses because out of courtesy to their officers and hosts they try to appear as appreciative of their efforts as possible. Nevertheless, the air becomes charged with a sort of discontent and apathy and the Local Secretary who without experience has assumed a great responsibility learns after the meeting is half over and it is too late to remedy it. I say, he then realizes a lot of things which had he known and anticipated would have made his work a much larger success and the results more satisfactory to all.

Now whether the program could be better arranged by spreading it over the entire week is not a matter which the writer wishes to discuss at this time. It might be well to take it under careful consideration, on the other hand it may be one of the factors concerning which the Local Secretary should have full freedom to arrange. But on the question as to whether we should call our meetings on schedule time or waste half our time waiting for them to be called, it is hardly conceivable that there can be any difference of opinion. There may be many ways to bring about an economical use of our time, but the one about to be proposed is recommended because it has been tried out and, *it works*.

In the first place not only the Local Secretary but the presiding chairmen are for the most part inexperienced in the work at hand, and unless the latter are emphatically instructed concerning their responsibilities they will not open their section sessions until a sufficient number have assembled; the members on the other hand, not desiring a long wait, hold back from assembling until they see a likelihood of the meeting being called and so the regular stalemate takes place of the meeting not being called, because no one is present and no one is present because there is no likelihood of the meeting being called.

It is therefore important that the Local Secretary face this annual catastrophy and head it off by appropriate action, *i. e.*, seeing to it that those upon whom will rest the responsibility of wielding the gavel during the meeting will call their sessions on schedule time. This can be accomplished by calling a meeting before the first session consisting of not only the chairmen, but vice-chairmen and secretaries, explaining to them the importance of calling meetings on schedule time and getting their promise to be in their place, watch and gavel in hand, and to call the meeting on the tick of the watch regardless of how many are present. This is not a visionary scheme, it has been tried and the essence upon which success of this effort depends is this detail, and the fact that it is a trifle spectacular. It should be further understood that if the chairman is not in his place the vice-chairman or, if necessary, the secretary, shall temporarily call the meeting. If this intention is well announced at the first session, the members will come out if for no other reason than to see our AMERICAN PHARMACEUTICAL ASSOCIATION meeting called on time. The Local Secretary, in order to coöperate with the chairman, should provide, in advance pages, to page the lobby and corridors of the hotel twice for each session; the first time five minutes before the session; announcing that the session is about to be called, and again, at the hour, announcing that the meeting is now in session. Bulletins in the lobby stating what meetings are in session and what papers are being read are also very helpful.

Now local secretaries change and the ASSOCIATION cannot profit by the experience gained by a secretary in conducting one meeting. The General Secretary, however, holds

over year after year. It would seem entirely feasible and from past experience and in behalf of the visiting members and the success of our meetings it seems very necessary that he should be directed to coöperate with the Local Secretary in these matters which come up year after year and which require the same solution. Unless some such steps are taken there is no basis for hope that we shall depart from the nerve-racking haphazard tendency which our progress has been assuming.

NEW YORK.

The January meeting of the New York Branch of the A. PH. A. was held at the New York College of Pharmacy on the 10th. President Clyde M. Eddy presided. The speaker of the evening was President Theodore J. Bradley of the A. PH. A. and his subject related to legislation. He divided legislation, nto three classes: constructive, punitive and regulatory.

He considered that the worst feature of most regulatory acts lies in their delegation to a bureau chief, the authority to make regulations having the force of law for the enforcement of the act. This, he said, had built up such a multiplicity of regulation sometimes conflicting with other regulations made by other bureaus as to sometimes make it impossible to avoid infraction of the law. The enforcement of these numberless laws and regulations required such a host of office holders that their support had become an almost intolerable burden on the taxpayer. It has been variously estimated by different students of political economy that from five to ten per cent of the citizens are office holders and this condition is rapidly growing worse. The speaker contended that steps should be taken to check this evil. A vote of thanks was tendered President Bradley.

A Committee was appointed to draw up resolutions for record and presentation to the family of the late Prof. Jeannot Hostmann.

The present officers were reëlected for the ensuing year and Clyde M. Eddy was elected delegate to the House of Delegates, A. PH. A.

The officers were instructed to notify the members that New York branch advocated the selection of Washington as a site for the pharmacy Headquarters Building.

PHILADELPHIA.

The January meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, January 11, 1927, at the P. A. R. D. Building, 2017 Spring Garden St., President Cliffe presiding.

Upon a motion from the floor the reading of the December minutes was dispensed with.

Chairman Hunsberger, of the committee on the headquarters building site, gave a report. He stated that if Philadelphia was going to make the attempt to secure the headquarters building we would have the coöperation of the Mayor, Chairman of the Finance Committee, and Department of Health, and that would mean that the idea would be favorably presented to the Council for action. However, in view of the recent straw vote which was taken of the Pennsylvania members, the Branch unanimously voted not to propose Philadelphia as a site, but to give their entire support and urge Pennsylvania members to support Washington, D. C. as the proper and logical site for the headquarters building.

Mr. Harrisson called to the attention of the Branch the radio advertising of proprietary products which has been going on recently. Considerable discussion followed and it was decided to take this topic as a subject for discussion at the February meeting. A motion was passed that a special committee be appointed by the President to consider this question and draft suitable resolutions to be sent to Mr. Hoover, the Council of the A. PH. A. and the Council of the A. M. A.

President Cliffe then introduced our distinguished guest of the evening, President Theodore J. Bradley of Boston, of the AMERICAN PHARMACEUTICAL ASSOCIATION. He gave a most interesting address on the subject of legislation. His talk had to do primarily with the great number of laws which are being made year after year and which act as a burden to the general public. Simply because there are a few wrongdoers the general public has to bear the brunt of a great many laws to-day. It has come to the point where our movements are guided by laws, and this is an evil which should be done away with by all means, although nothing can be done until the public is educated upon this subject. Considerable discussion followed Dr. Bradley's talk, the following taking part: Messrs. Cliffe, Fischelis, Viehoever, Griffith and Wood.

A rising vote of thanks was tendered to President Bradley for coming to Philadelphia

and presenting this message to the Branch.

Attention was called to the fact that at the March meeting the annual election and installation of officers will be held, this being the usual time for the annual dinner at which the Past-Presidents are entertained.

A motion was passed that a committee be appointed to consider this annual meeting and make the necessary plans for it.

The meeting was very well attended and about twenty-five of the members were present at the dinner which preceded the meeting.

ADLEY B. NICHOLS, *Secretary.*

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1926–1927.

Office of the Secretary, 10 West Chase St., Baltimore, Md.

LETTER NO. 7.

January 27, 1927.

To the Members of the Council:

70. Budget for 1927. Motion No. 16 (See Council Letter No. 5, page 81) has been carried and the budget, as submitted, is adopted.

71. Election of Members. Motion No. 17 (See Council Letter No. 5, page 82). *Motion No. 18* (See Council Letter No. 5, page 83), *Motion No. 21* (See Council Letter No. 6, page 83) and *Motion No. 22* (See Council Letter No. 6, page 84) have been carried. Applicants for membership numbered 54 to 92 inclusive and applicants for membership numbered H-165 to H-245 inclusive are, therefore, declared elected.

72. Award of the Contract for Printing and Mailing the Journal for 1927. Motion No. 19 (See Council Letter No. 6, page 82) received fifteen affirmative votes, and as no objection to the taking of the vote was expressed, the motion is declared carried. The contract is awarded to the Mack Printing Company of Easton, Pa.

73. Temple of Health, Chicago Exposition of 1933. Motion No. 20 (See Council Letter No. 6, page 82) has been carried and the Secretary will promptly communicate with the authorities having this exposition in charge.

74. Application for Permission to Use the Text of the N. F. V. The following letter has been received from Chairman A. G. DuMez of the Committee on Publications:

"This will acknowledge receipt of the request of Mr. Geo. E. Rehberger of Phoenix, Md., for permission to use portions of the test of the National Formulary V for comment in a pocket Therapeutic Vade Mecum which he is preparing.

"I have gone over the form of text and the use which is to be made of the National Formulary text is very similar to that used in other books for which the ASSOCIATION has given the respective authors permission. I, therefore, see no reason why it should be necessary for the Publication Committee to vote upon the matter and will recommend that permission be given Mr. Geo. E. Rehberger to use the text of the National Formulary V as requested. Of course he should be charged a minimum fee of $5.00.

"Please put this matter before the Council in the next letter which you get out."

(Motion No. 23.) It is moved by DuMez that George E. Rehberger, Phoenix, Md., be granted permission to use the text of the N. F. V. for partial reproduction in the pocket Therapeutic Vade Mecum, and at the usual charge of $5.00.

74. Life Members. The following have become Life Members of the ASSOCIATION in accordance with Article IV of Chapter IX of the By-Laws: George Clarence Blakeley, The Dalles, Ore.; Alfred Augustus Burnham, Jr., Boston, Mass.; Frank Henry Carter, Indianapolis, Ind.; Alfred Robert Louis Dohme, Baltimore, Md.; Samuel William Fairchild, New York, N. Y.; John William Gayle, Frankfort, Ky.; William Henry Glover, Lawrence, Mass.; and life membership certificates will be sent them.

75. Local Secretary for 1927 Meeting. The Secretary has been in correspondence with Dr. C. E. Caspari and other members in St. Louis, and is advised that Mr. A. W. Pauley, 3130 N. Grand St., St. Louis, is the preference for Local Secretary. Mr. Pauley recently visited President Bradley and the office of the ASSOCIATION, and, after going over the whole

proposition, is willing to accept the office if elected.

Mr. A. W. Pauley is nominated as Local Secretary for 1926–1927, by E. F. Kelly. If other members of the Council wish to submit nominations, they are requested to forward the same to the Secretary promptly in order that a vote may be taken at an early date.

76. Ebert Prize Medal. Prof. John Uri Lloyd has requested permission to obtain, at his expense, Ebert Medals for the years (1882, 1891 and 1916) in which the Ebert Prize was awarded to him. The following is quoted from Prof. Lloyd's letter:

> "My object is to receive medals commemorative of the prizes awarded me in the past. I will give the data as regards the date and subject and will pay the entire expense of the medals, which should accord (in my opinion) with those you have established and which are now to be awarded to those selected.
>
> "My purpose is to add all these medals in the department of the United States National Museum in connection with other medals and historical exhibits commemorative of work in pharmacy that I have been able to accomplish since 1879."

Reference is made to the list of those to whom the Ebert Prize has been awarded as given on page XLI of Volume 13 of the YEAR BOOK, and to the action of the Executive Committee of the Council in reference to the medal as given on page 264 of the JOURNAL OF THE A. PH. A. for March 1925 and which was later approved by the Council.

A silver medal was awarded for 1925 and 1926 at a cost to the ASSOCIATION of $35.00 each.

(*Motion No. 24.*) *It is moved by Eberle that the Secretary of the Association be authorized to furnish Prof. John Uri Lloyd with Ebert Medals for the years 1882, 1891 and 1916 and at Prof. Lloyd's expense.* Prof. Lloyd has asked for an early reply to his request as he expects to leave for California at an early date. A vote is, therefore, called for on this motion at this time but it will be considered tentative if any member of the Council objects or desires to submit comment.

77. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received:

No. 93, Theodore Archer, White Hall, Md.; No. 94, Frederick F. Blicke, 906 Granger Ave., Ann Arbor, Mich.; No. 95, Orren Leroy Brooks, 458 East Erie St., Painesville, Ohio; No. 96, Leroy DeLos Edwards, 950 N. Garfield Ave., Indianapolis, Ind.; No. 97, Herbert Martin Emig, 701 S. Wood St., Chicago, Ill.; No. 98, A. Hastings Fiske, c/o Eli Lilly & Co., Indianapolis, Ind.; No. 108, Henry C. Biddle, 2815 Stuart St., Berkeley, Calif.; No. 99, George C. Hacker, 606 Blue Island Ave., Chicago, Ill.; No. 100, Leo Mrazek, Oak Park Ave. and Washington St., Oak Park, Ill.; No. 101, Charles P. Muth, 23–25 South Charles St., Baltimore, Md.; No. 102, Arthur Warren Parker, 1890 Ontario Place, Washington, D. C.; No. 103, Charles Edward Rawe, 909 North Charles St., Baltimore, Md.; No. 104, Emerson Van Romig, 91 North Main St., Keyser, W. Va.; No. 105, William Coates Royse, 802 E. Market St., Indianapolis, Ind.; No. 106, Norman Frederick Storm, 61 Prospect Ave., Catonsville, Md.; No. 107, Arthur Storch, 1500 W. Baltimore St., Baltimore, Md.

(*Motion No. 25.*) *Vote on applications for active membership in the American Pharmaceutical Association.*

78. Applicants for Membership on Account of Contributions to the Headquarters Building Fund. The following non-members of the A. PH. A. have pledged $25.00 or more to the Headquarters Building Fund and have made a cash payment of $5.00 or more. They are entitled to membership and you are requested to vote on the applications which have been properly endorsed.

H-246, Rugnar Almin, 1714 5th Street S. E., Minneapolis, Minn.; H-247, Earl Bass, Laurel, Nebr.; H-248, Edwin Berry, 3730 1st Ave., Sacramento, Calif.; H-249, Lewis Clemence Britt, 516 North 15th St., Corvallis, Oreg.; H-250, Lloyd W. Brown, 672 W. 34th St., Los Angeles, Calif; H-251, George F. Cermak, 5503 Clark Ave., Cleveland, Ohio; H-252, Ruth Covell, Mass. College of Pharmacy, Boston, Mass.; H-253, Troy C. Daniels, 702 Campus St., Pullman, Wyo.; H-254, Sydney Ellias, 2011 Taylor St., Detroit, Mich.; H-255, Burley Sylvester Emerick, 101 W. Berkeley St., Uniontown, Pa.; H-256, Raymond J. Emmerich, 1st and 1st Bx 14, Madison, Wis.; H-257, Samuel Morgan Evans, 408 Luzerne Ave., West Pittston, Pa.; H-258, Joseph A. Fontana, 524 Metropolitan Ave., Brooklyn, N. Y.; H-259, David Gard, 24 Homewood Terrace, San Francisco, Calif.; H-260, Earl Gibson, Cozad, Nebr.; H-261, Malcolm J.

Goudelock, 4715 Edmondson Ave., Baltimore, Md.; H-262, George Paul Greenberg, 431 Eastern Ave., Malden, Mass.; H-263, Stephen Thomas Grosch, Center St., Thomaston, Conn.; H-264, Matthew Katsuo Hayashi, 357 Beretania St., Honolulu, Hawaii; H-265, Jean Emmons Lancaster, Groton, Mass.; H-266, Elmer Louis Lindberg, 809 So. 35th Ave., Omaha, Nebr.; H-267, Basil McHaney, 7311 Middlesex Ave., Fordson, Mich.; H-268, William C. Perrella, 2105 Beverle Road, Brooklyn, N. Y.; H-269, Elmo D. Reed, Refugio, Texas; H-270, John Alexander Russell, Arbutus, Halethorpe P. O., Md.; H-271, John Emerson Somerlot, 109 Rubicon St., Dayton, Ohio; H-272, Clifton B. Staley, 14 E. Southern Ave., Baltimore, Md.; H-273, Harry Stine, 3425 Park Heights Ave., Baltimore, Md.

(*Motion No. 26.*) *Vote on applications of contributors to the Headquarters Building Fund for Membership in the American Pharmaceutical Association.*

79. Applicants for Life Membership on Account of Contributions to the Headquarters Building Fund. Under a provision made by the Board of Directors of the A. PH. A. at a meeting held in Washington, D. C., on December 7, 1923, a contributor to the Headquarters Building Fund who subscribed $1000.00 or more is entitled to Life Membership. The following application, which has been properly endorsed, is submitted under this provision.

L. M., 2, John C. Muth, 23 S. Charles St., Baltimore, Md.

(*Motion No. 27.*) *Vote on application for Life Membership in the American Pharmaceutical Association.*

E. F. KELLY, *Secretary.*

BILL FOR CONTROL AND MANUFACTURE AND SALE OF MEDICINAL LIQUOR.

The Committee on Ways and Means of the House at an executive session on February 2nd, by a vote of 16 to 8 defeated the bill to authorize the manufacture of medicinal spirits by the proposed corporation under Government supervision. A new medicinal liquor bill has been formulated by a sub-committee in coöperation with the Department of the Treasury as a substitute for the foregoing, which was named the Andrews bill. The new bill retains the title of the former, namely, "a bill to conserve the revenues from medicinal spirits and to provide for the effective government control of such spirits, to prevent the evasion of taxes and for other purposes."

The new measure provides for the original directorate of the proposed medicinal liquor corporation to be appointed by the Secretary of the Treasury to serve until 100,000 shares of the common stock of the corporation shall have been sold. Ninety days thereafter, under the bill, the Secretary of the Treasury, Secretary of Commerce, and the Surgeon General of the United States, shall elect a new board for a one-year term and successive boards shall be elected annually thereafter.

The sub-committee is headed by representative Hawley of Oregon and the other members are Representatives Treadway, Hadley, Chindblom, Collier, Rainey and Doughton.

Attorney E. C. Brokmeyer of the N. A. R. D. has submitted that "if Congress decides to fix the price at which medicinal spirits shall be sold by retail druggists there would also have to be fixed the price for manufacturing, the price at which it should be sold to retail druggists, and the price physicians shall charge for writing liquor prescriptions."

Evidently part of such provisions are contemplated. Pharmacists did not seek nor did they wish to become dispensers of liquor as medicine. However, having been selected by Congress it would seem that they should be accorded the consideration of handling liquor as they do all medicines and not be restricted by special packages, etc.

The AMERICAN PHARMACEUTICAL ASSOCIATION is on record (Buffalo meeting, 1924) as approving the standards of the U. S. Pharmacopœia and the National Formulary as the sole standards that should be relied upon in determining the quality of alcohol and alcoholic liquors for medicinal purposes.

J. W. LECOURS.

J. W. Lecours, professor of Materia Medica at Laval University, School of Pharmacy, Canada, died December 31st, age 58 years. He was a graduate of Montreal College of Pharmacy and until 1906 a member of this faculty. Professor Lecours was also the owner of a pharmacy at the time of his death.

A HALF CENTURY OF THE NATIONAL FORMULARY, 1880–1930.

BY H. A. LANGENHAN.

(*Continned from p. 93, Jan.* JOUR. A. PH. A.)

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
SAL POTASSII BROMIDI EFFERVESCENS COMPOSITUS	..	..	..	..	..	..	..	..	..	..	L	L
Compound Effervescent Salt of Potassium Bromide	..	..	..	..	..	..	..	..	..	..	E	E
PULVIS POTASSII BROMIDI EFFERVESCENS CUM CAFFEINÆ	..	..	..	..	..	..	..	..	L	L	..	..
Pulvis Potassii Bromidi Effervescens cum Caffeinæ	..	..	..	..	..	..	..	..	..	..	S	S
Effervescent Potassium Bromide with Caffeine	..	..	..	..	..	..	..	..	S	S	S	S
Effervescent Powder of Potassium Bromide with Caffeine	..	..	..	..	..	..	..	..	E	E	..	..
POTASSIUM BROMIDE EFFERVESCENS CUM CAFFEINA	..	..	..	..	..	..	..	L	..	..	..	..
Effervescent Bromide of Potassium with Caffeine	..	..	..	..	..	..	..	E	..	..	..	..
Sal. Pot. Brom. Eff. Co.	..	..	..	..	..	..	..	..	..	..	A	A
SAL VICHYANUM FACTITIUM	..	..	..	..	..	..	..	L	L	L	L	L
Artificial Vichy Salt	..	..	..	..	..	..	..	E	E	E	E	E
Sal. Vichy. Fact.	..	..	..	..	..	..	..	..	..	..	A	A
SAL VICHYANUM FACTITIUM EFFERVESCENS	..	..	..	..	..	..	..	L	..	..	L	L
Effervescent Artificial Vichy Salt	..	..	..	..	..	..	..	..	..	..	E	E
Effervescent Artificial Vichy Salt	..	..	..	..	..	..	..	..	..	S	..	..
PULVIS SALIS VICHYANI FACTITII EFFERVESCENS	..	..	..	..	..	..	..	..	L	L	..	..
Pulvis Salis Vichyani Factitii Effervescens.	..	..	..	..	..	..	..	..	..	..	S	..
Effervescent Powder of Artificial Vichy Salt	..	..	..	..	..	..	..	..	E	E	..	..
Artificial Effervescent Vichy Salt	..	..	..	..	..	..	..	E	..	..	..	..
Sal. Vichy. Fact. Eff.	..	..	..	..	..	..	..	..	..	..	A	A
SAL VICHYANUM FACTITIUM EFFERVESCENS CUM LITHIO	..	..	..	..	..	..	..	L	..	..	L	..
Effervescent Artificial Vichy Salt with Lithium	..	..	..	..	..	..	..	..	..	..	E	..
Effervescent Artificial Vichy Salt with Lithium	..	..	..	..	..	..	..	..	..	S	..	..
PULVIS SALIS VICHYANI FACTITII EFFERVESCENS CUM LITHIO	..	..	..	..	..	..	..	..	L	L	..	..
Pulvis Salis Vichyani Factitii Effervescens cum Lithio	..	..	..	..	..	..	..	..	..	S	..	..
Effervescent Powder of Artificial Vichy Salt with Lithium	..	..	..	..	..	..	..	..	E	E	..	..
Artificial Effervescent Vichy Salt with Lithium	..	..	..	..	..	..	..	E	..	..	..	..
Sal. Vichy. Fact. Eff. c. Lith.	..	..	..	..	..	..	..	..	..	..	A	..
SALIA EFFERVESCENTIA	..	..	..	..	..	..	..	..	..	..	L	L
Granular Effervescent Salts	..	..	..	..	..	..	..	..	..	..	E	E

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
SAPO VIRIDIS	..	..	..	..	..	..	..	L	207	207	207	207
Green Soap	..	..	..	..	..	..	..	E	..	..	..	..
SEVUM BENZOINATUM	..	..	..	..	..	..	..	..	..	..	L	L
Benzoinated Suet	..	..	..	..	..	..	..	..	..	..	E	E
Sev. Benz.	..	..	..	..	..	..	..	..	..	..	A	A
SODA CUM CALC	..	..	..	..	..	..	..	L	L	L	L	..
Soda with Lime	..	..	..	..	..	..	..	E	E	E	E	..
London Paste	..	..	..	..	..	..	..	S	S	S	S	..
Sod. c. Calc.	..	..	..	..	..	..	..	..	..	..	E	..
SODII BORO-BENZOAS	..	..	..	..	..	..	..	L	L	L	L	..
Sodium Boro-Benzoat	..	..	..	..	..	..	..	E	E	E	E	..
Sod. Boro. Benz.	..	..	..	..	..	..	..	..	..	..	A	..
SODII BICARBONATIS SACCHARATUS	..	..	..	..	..	..	..	..	L	L	..	..
Saccharated Sodium Bicarbonate	..	..	..	..	..	..	..	..	E	E	..	..
SOLUTIO MASTICHES CHLOROFORMICA COMPOSITA	..	..	..	..	..	..	..	..	..	..	..	L
Compound Chloroformic Solution of Mastic	..	..	..	..	..	..	..	..	..	..	..	E
Pulp. Capping Varnish	..	..	..	..	..	..	..	..	..	..	..	S
Sol. Mastic. Chlorof. Co.	..	..	..	..	..	..	..	..	..	..	..	A
SOLUTIO RESINÆ CHLOROFORMICA	..	..	..	..	..	..	..	..	..	..	..	L
Chloroformic Solution of Rosin	..	..	..	..	..	..	..	..	..	..	..	E
Sol. Resin. Chlorof.	..	..	..	..	..	..	..	..	..	..	..	A
SPECIES EMOLLIENTES	..	..	..	..	..	..	..	L	L	L	L	L
Emollient Species	..	..	..	..	..	..	..	E	E	E	E	E
Emollient Cataplasm	..	..	..	..	..	..	..	S	S	S	S	S
Spec. Emoll.	..	..	..	..	..	..	..	..	..	..	A	A
SPECIES LAXATIVÆ	..	..	..	..	..	..	..	..	..	..	L	L
Laxative Species	..	..	..	..	..	..	..	E	E	E	E	E
SPECIES LAXANTES	..	..	..	..	..	..	..	L	L	L	..	..
Species Laxantes	..	..	..	..	..	..	..	..	..	..	S	S
St. Germains Tea	..	..	..	..	..	..	..	S	S	S	S	S
Spec. Lax.	..	..	..	..	..	..	..	..	..	..	A	A
SPECIES PECTORALES	..	..	..	..	..	..	..	L	L	L	L	L
Pectoral Species	..	..	..	..	..	..	..	E	E	E	E	E
Species Infusum Pectoral	..	..	..	..	..	..	..	S	S	S	S	S
Breast Tea	..	..	..	..	..	..	..	S	S	S	S	S
Spec. Pect.	..	..	..	..	..	..	..	..	..	..	A	A
SPIRITUS ACIDI FORMICI	..	..	..	..	..	..	..	L	L	L	L	L
Spirit of Formic Acid	..	..	..	..	..	..	..	E	E	E	E	E
Spiritus Formicarum	..	..	..	..	..	..	..	S	S	S	S	S
Spirit of Ants	..	..	..	..	..	..	..	S	S	S	S	S
Sp. Ac. Formic.	..	..	..	..	..	..	..	..	..	..	A	A
SPIRITUS ÆTHERIS	208	208	208	..	..	..	..	208	208	208	208	L
Spirit of Ether	..	..	..	..	..	..	..	..	..	..	..	E
Hoffmann's Drops	..	..	..	..	..	..	..	..	..	..	..	S
Sp. Aeth.	..	..	..	..	..	..	..	..	..	..	..	A
SPIRITUS ÆTHERIS COMPOSITUS	209	209	209	209	209	209	209	209	209	209	L	L
Compound Spirit of Ether	..	..	..	..	..	..	..	..	..	..	E	E

207—See **SAPO MOLLIS**, U. S. P.
208—See **SPIRITUS ÆTHERIS**, U. S. P.
209—See **SPIRITUS ÆTHERIS COMPOSITUS**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
Hoffman's Anodyne	..	..	..	..	..	..	..	..	..	..	S	S
Sp. Æth. Co.	..	..	..	..	..	..	..	..	..	..	A	A
SPIRITUS AMMONIÆ ANISATUS	..	..	..	..	..	..	..	..	..	..	L	L
Anisated Spirit of Ammonia	..	..	..	..	..	..	..	..	..	..	E	E
Liquor Ammoniæ Anisatus	..	..	..	..	..	..	..	..	..	..	S	S
Anisated Solution of Ammonia	..	..	..	..	..	..	..	..	..	..	S	S
Sp. Ammon. Anis.	..	..	..	..	..	..	..	..	..	..	A	A
SPIRITUS AMYGDALÆ AMARÆ	..	..	..	..	..	..	..	L	210	210	210	L
Spirit of Bitter Almond	..	..	..	..	..	..	..	E	..	..	..	E
Essence of Bitter Almond	..	..	..	..	..	..	..	S	..	..	..	..
Sp. Amygd. Amar.	..	..	..	..	..	..	..	..	..	..	..	A
SPIRITUS AROMATICUS	..	..	..	..	..	..	..	L	L	L	..	..
Aromatic Spirit	..	..	..	..	..	..	..	E	E	E	..	..
SPIRITUS AURANTII	..	..	..	..	..	..	..	211	211	L	..	..
Spirit of Orange	..	..	..	..	..	..	..	..	..	E	..	..
SPIRITUS AURANTII COMPOSITUS	..	..	..	..	..	..	..	L	212	212	212	212
Compound Spirit of Orange	..	..	..	..	..	..	..	E	..	..	..	..
SPIRITUS CARDAMOMI COMPOSITUS	..	..	..	..	..	..	..	L	L	L	L	L
Compound Spirit of Cardamon	..	..	..	..	..	..	..	E	E	E	E	E
Sp. Card. Co.	..	..	..	..	..	..	..	..	..	..	A	A
SPIRITUS CURASSAO	..	..	..	..	..	..	..	L	L	L	..	..
Spirit of Curacaco	..	..	..	..	..	..	..	E	E	E	..	..
SPIRITUS GLONOINI	..	..	..	..	..	..	..	L	213	213	213	213
Spirit of Glonoin	..	..	..	..	..	..	..	E	..	..	..	..
Spirit of Nitroglycerin	..	..	..	..	..	..	..	S	..	..	..	..
Solution of Nitroglycerin	..	..	..	..	..	..	..	S	..	..	..	..
SPIRITUS LIMONIS	..	..	..	..	..	214	214	214	214	L	..	..
Spirit of Lemon	..	..	..	..	..	..	..	..	..	E	..	..
Essence of Lemon	..	..	..	..	..	..	..	..	..	S	..	..
SPIRITUS MYRCIÆ COMPOSITUS	..	..	..	..	..	215	215	215	215	..	L	L
Compound Spirit of Myrcia	..	..	..	..	..	..	..	..	..	..	E	E
SPIRITUS MYRCIÆ	..	..	..	..	..	..	..	..	..	L	..	..
Spirit of Myrcia	..	..	..	..	..	..	..	..	..	E	..	..
Bay Rum	..	..	..	..	..	..	..	..	..	S	..	..
Sp. Myrciæ Co.	..	..	..	..	..	..	..	..	..	..	A	A
SPIRITUS MYRISTICÆ	..	216	..	216	216	216	216	216	216	L	..	..
Spirit of Nutmeg	..	..	..	..	..	..	..	..	..	E	..	..
Essence of Nutmeg	..	..	..	..	..	..	..	..	..	S	..	..
SPIRITUS ODORATUS	..	..	..	..	..	..	..	217	L	L	L	L
Perfumed Spirit	..	..	..	..	..	..	..	..	E	E	E	E
Cologne Water	..	..	..	..	..	..	..	..	S	S	..	..
Aqua Cologniensis	..	..	..	..	..	..	..	..	..	..	..	S
Sp. Odorat.	..	..	..	..	..	..	..	..	..	..	A	A
SPIRITUS OLEORUM VOLATILUM	..	..	..	..	..	..	..	..	..	..	L	L
Spirits of Volatile Oils	..	..	..	..	..	..	..	..	..	..	E	E

210—See **SPIRITUS AMYGDALÆ AMARÆ,** U. S. P.
211—See **SPIRITUS AURANTII,** U. S. P.
212—See **SPIRITUS AURANTII COMPOSITUS,** U. S. P.
213—See **SPIRITUS GLYCERYLIS NITRATIS,** U. S. P.
214—See **SPIRITUS LIMONIS,** U. S. P.
215—See **SPIRITUS MYRCIÆ,** U. S. P.
216—See **SPIRITUS MYRISTICÆ,** U. S. P.
217—See **SPIRITUS ODORATUS,** U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
SPIRITUS OLEI VOLATILIS	..	..	..	..	..	..	..	L	L	L	..	..
Spirit of Volatile Oil	..	..	..	..	..	..	..	E	E	E	..	..
SPIRITUS OPHTHALMICUS	..	..	..	..	..	..	..	L	L	L	..	..
Ophthalmic Spirit	..	..	..	..	..	..	..	E	E	E	..	..
Alcoholic Eye Wash	..	..	..	..	..	..	..	S	S	S	..	..
SPIRITUS PHOSPHORI	..	..	..	..	..	..	..	L	218	L	..	..
Spirit of Phosphorous	..	..	..	..	..	..	..	E	..	E	..	..
Tincture of Phosphorous	..	..	..	..	..	..	..	S	..	S	..	..
SPIRITUS SAPONATUS	..	..	..	..	..	..	..	L	L	L	..	..
Spirit of Soap	..	..	..	..	..	..	..	E	E	E	..	..
SPIRITUS SINAPIS	..	..	..	..	..	..	..	L	L	L	L	L
Spirit of Mustard	..	..	..	..	..	..	..	E	E	E	E	E
Sp. Sinap.	..	..	..	..	..	..	..	..	..	..	A	A
SPIRITUS VANILLINI COMPOSITUS	..	..	..	..	..	..	..	..	..	..	L	L
Compound Spirit of Vanillin	..	..	..	..	..	..	..	..	..	..	E	E
Sp. Vanil. Co.	..	..	..	..	..	..	..	..	..	..	A	A
SPONGIA COMPRESSA	..	..	..	..	..	..	..	L	L	L	..	..
Compressed Sponge	..	..	..	..	..	..	..	E	E	E	..	..
Sponge Tent	..	..	..	..	..	..	..	S	S	S	..	..
SPONGIA DECOLORATA	..	..	..	..	..	..	..	L	L	L	..	..
Decolorized Sponge	..	..	..	..	..	..	..	E	E	E	..	..
Bleached Sponge	..	..	..	..	..	..	..	S	S	S	..	..
STILI MEDICAMENTORUM	..	..	..	..	..	..	..	..	..	..	..	L
Medicated Pencils	..	..	..	..	..	..	..	..	..	..	..	E
STILI DILUBILES	..	..	..	..	..	..	..	..	..	L	L	..
Paste Pencils	..	..	..	..	..	..	..	..	..	E	E	..
Paste Pencils	..	..	..	..	..	..	..	..	..	..	..	S
Unna Pencils	..	..	..	..	..	..	..	..	..	S	S	S
Stil. Dilub.	..	..	..	..	..	..	..	..	..	..	A	..
Stil. Medic.	..	..	..	..	..	..	..	..	..	..	..	A
STILI ACIDI SALICYLICI	..	..	..	..	..	..	..	..	..	..	..	L
STILI ACIDI SALICYLICI DILUBILES	..	..	..	..	..	..	..	..	..	L	L	..
Salicylic Acid Pencil	..	..	..	..	..	..	..	..	..	E	E	E
Stil. Acid. Sal. Dilub.	..	..	..	..	..	..	..	..	..	..	A	..
Stil. Acid. Salicyl.	..	..	..	..	..	..	..	..	..	..	..	A
STILI COCAINÆ DILUBILES	..	..	..	..	..	..	..	..	..	L	..	..
Cocaine Pencils	..	..	..	..	..	..	..	..	..	E	..	..
SUCCUS CITRI ET PEPSINUM	..	..	..	..	..	..	..	..	..	..	L	..
Lime Juice and Pepsin	..	..	..	..	..	..	..	E	E	E	E	..
SUCCUS LIMETTÆ CUM PEPSINO	..	..	..	..	..	..	..	..	..	L	..	..
SUCCUS LIMONIS CUM PEPSINO	..	..	..	..	..	..	..	L	L	..	..	..
Suc. Cit. et Pepsin	..	..	..	..	..	..	..	..	..	..	A	..
SULPHURIS IODIDUM	..	..	..	219	219	219	219	219	219	219	L	L
Sulphur Iodide	..	..	..	..	..	..	..	..	..	..	E	E
Sulphur. Iod.	..	..	..	..	..	..	..	..	..	..	A	A
SUPPOSITORIA BOROGLYCERINI	..	..	..	..	..	..	..	..	..	L	L	L
Suppositories of Boroglycerin	..	..	..	..	..	..	..	..	..	E	E	E
Suppos. Boroglycer.	..	..	..	..	..	..	..	..	..	..	A	..
Supp. Boroglycerin	..	..	..	..	..	..	..	..	..	..	..	A

218—See **SPIRITUS PHOSPHORI**, U. S. P.
219—See **SULPHURIS IODIDUM**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
SYRUPI	..	..	..	..	..	..	..	..	..	L	L	L
Syrups	..	..	..	..	..	..	..	..	..	E	E	E
SYRUPUS ACIDI HYDRIODICI DECOLORIZATA	..	..	..	..	..	..	..	L	..	..	..	..
Colorless Syrup of Hydriodic Acid	..	..	..	..	..	..	..	E	..	..	..	..
SYRUPUS ALLII	220	220	220	220	220	220	220	220	220	L	L	L
Syrup of Garlic	..	..	..	..	..	..	..	..	..	E	E	E
Syr. Allii	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS ALTHEÆ	..	..	..	..	..	..	..	221	221	L	L	L
Syrup of Altheæ	..	..	..	..	..	..	..	..	..	E	E	E
Syrup of Marshmallow	..	..	..	..	..	..	..	..	..	S	..	..
Syr. Althæ	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS AMMONII HYPOPHOSPHITIS	..	..	..	..	..	..	..	..	..	..	L	L
Syrup of Ammonium Hypophosphite	..	..	..	..	..	..	..	..	..	..	E	E
Syr. Ammon. Hypophos	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS ASARI COMPOSITUS	..	..	..	..	..	..	..	L	L	L	L	L
Compound Syrup of Asarum	..	..	..	..	..	..	..	E	E	E	E	E
Compound Syrup of Canada Snake-Root	..	..	..	..	..	..	..	S	S	S	..	..
Syr. Asar. Co	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS BROMIDORUM	..	..	..	..	..	..	..	..	..	L	L	L
Syrup of the Bromides	..	..	..	..	..	..	..	..	..	E	E	E
Syr. Bromidor	..	.	..	..	..	..	..	..	..	..	A	A
SYRUPUS CACAO	..	..	..	..	..	..	..	..	..	..	..	L
Syrup of Cocoa	..	..	..	..	..	..	..	..	..	..	..	E
Syrup of Chocolate	..	..	..	..	..	..	..	..	..	..	..	S
Syr. Cacao Præp	..	..	..	..	..	..	..	..	..	..	..	A
SYRUPUS CALCII ET SODII HYPOPHOSPHITUM	..	..	..	..	..	..	..	L	L	L	L	L
Syrup of Calcium and Sodium Hypophosphites	..	..	..	..	..	..	..	E	E	E	E	E
Syrup of the Hypophosphites of Lime and Soda	..	..	..	..	..	..	..	S	S	S	..	..
Syr. Calc. et Sod. Hypophos	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS CALCII HYDROCHLOROPHOSPHATIS	..	..	..	..	..	..	..	..	..	..	L	..
Syrup of Calcium Hydrochlorophosphate	..	..	..	..	..	..	..	..	..	..	E	..
SYRUPUS CALCII CHLORHYDROPHOSPHATIS	..	..	..	..	..	..	..	L	L	L	..	..
Syrupus Calcii Chlorophosphatis	..	..	..	..	..	..	..	..	..	..	S	..
Syrup of Calcium Chlorhydrophosphate	..	..	..	..	..	..	..	E	E	E	..	..
Syrup of Chlorhydrophosphate of Lime	..	..	..	..	..	..	..	S	S	S	..	..
Syr. Calc. Hydrochlorphos	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS CALCII HYPOPHOSPHITIS	..	..	..	..	..	..	..	L	L	L	L	L
Syrup of Calcium Hypophosphite	..	..	..	..	..	..	..	E	E	E	E	E
Syrup of Hypophosphite of Lime	..	..	..	..	..	..	..	S	S	S	..	..
Syr. Calc. Hypophos	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS CALCII IODIDI	..	..	..	..	..	..	..	L	L	L	L	L
Syrup of Calcium Iodide	..	..	..	..	..	..	..	E	E	E	E	E
Syr. Calc. Iodid	..	..	..	..	..	..	..	..	..	..	A	A

220—See **SYRUPUS ALLII, U. S. P.**
221—See **SYRUPUS ALTHÆÆ, U. S. P.**

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
SYRUPUS CALCII LACTOPHOSPHATIS	..	..	..	..	..	..	..	222	222	222	222	L
Syrup of Calcium Lactophosphate	..	..	..	..	..	..	..	..	..	..	..	E
Syr. Calc. Lactophos.	..	..	..	..	..	..	..	..	..	..	..	A
SYRUPUS CALCII LACTOPHOSPHATIS ET FERRI	..	..	..	..	..	..	..	..	..	..	L	L
Syrup of Calcium Lactophosphate and Iron	..	..	..	..	..	..	..	..	..	..	E	E
SYRUPUS CALCII LACTOPHOSPHATIS CUM FERRO	..	..	..	..	..	..	..	L	L	L	..	..
Syrupus Calcii Lactophosphatis cum Ferro	..	..	..	..	..	..	..	..	..	..	S	..
Syrup of Calcium Lactophosphate with Iron	..	..	..	..	..	..	..	E	E	E	..	..
Syrup of Lactophosphate of Lime with Iron	..	..	..	..	..	..	..	S	S	S	..	..
Syr. Calc. Lactophos. et Ferri.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS CIMICIFUGÆ COMPOSITUS	..	..	..	..	..	..	..	..	..	..	L	..
Compound Syrup of Cimicifuga	..	..	..	..	..	..	..	..	..	..	E	..
Compound Syrup of Cimicifuga	..	..	..	..	..	..	..	S	S	S	..	..
Compound Syrup of Actæa	..	..	..	..	..	..	..	E	E	E	..	..
Compound Syrup of Actæa	..	..	..	..	..	..	..	..	..	..	S	..
SYRUPUS ACTÆÆ COMPOSITUM	..	..	..	..	..	..	..	L	L	L	..	..
Syrupus Actææ Compositum	..	..	..	..	..	..	..	..	..	..	S	..
Compound Syrup of Black Cohosh	..	..	..	..	..	..	..	S	S	S	..	..
Syr. Cimicif. Co.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS CHONDRI COMPOSITUS	..	..	..	..	..	..	..	L	L	L	..	..
Compound Syrup of Chondrus	..	..	..	..	..	..	..	E	E	E	..	..
Compound Syrup of Irish Moss	..	..	..	..	..	..	..	S	S	S	..	..
SYRUPUS CINNAMOMI	..	..	..	..	..	..	..	L	L	L	L	L
Syrup of Cinnamon	..	..	..	..	..	..	..	E	E	E	E	E
Syr. Cinnam.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS CODEINÆ	..	..	..	..	..	..	..	..	L	L	L	..
Syrup of Codeine	..	..	..	..	..	..	..	..	E	E	E	..
Syr. Codein.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUP OF COFFEÆ	..	..	..	..	..	..	..	L	L	L	..	..
Syrup of Coffee	..	..	..	..	..	..	..	E	E	E	..	..
SYRUPUS ERIODICTYI AROMATICUS	..	..	..	..	..	..	..	L	L	L	L	L
Aromatic Syrup of Eriodictyon	..	..	..	..	..	..	..	E	E	E	E	E
Aromatic Syrup of Yerba Santa	..	..	..	..	..	..	..	S	S	S	S	S
Syrupus Corrigens	..	..	..	..	..	..	..	S	S	S	S	S
Syr. Eriodict. Arom.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS FERRI ARSENATIS	..	..	..	..	..	..	..	L	L	L	..	..
Syrup of Arsenate of Iron	..	..	..	..	..	..	..	E	E	E	..	..
SYRUPUS FERRI BROMIDI	..	..	..	..	..	..	..	223	L	L	..	..
Syrup of Bromide of Iron	..	..	..	..	..	..	..	..	E	E	..	..
SYRUPUS FERRI CITRO-IODIDE	..	..	..	..	..	..	..	L	L	L	..	..
Syrupus of Citro-Iodide of Iron	..	..	..	..	..	..	..	E	E	E	..	..
Tasteless Syrup of Iodide of Iron	..	..	..	..	..	..	..	..	S	S	..	..
SYRUPUS FERRI ET MANGANI IODIDI	..	..	..	..	..	..	..	L	L	L	L	..
Syrup of Iron and Manganese Iodide	..	..	..	..	..	..	..	E	E	E	E	..
Syr. Ferr. et Mangan. Iod.	..	..	..	..	..	..	..	..	..	..	A	..

222—See **SYRUPUS CALCII LACTOPHOSPHATIS**, U. S. P.
223—See **SYRUPUS FERRI BROMIDI**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
SYRUPUS FERRI HYPOPHOSPHITES	..	..	..	..	..	..	..	L	L	L	L	..
Syrup of Ferric Hypophosphite	..	..	..	..	..	..	..	E	E	E	E	..
Syr. Ferr. Hypophos.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS FERRI LACTOPHOSPHATIS	..	..	..	..	..	..	..	L	L	L	L	..
Syrupus of Iron Lacto Phosphate	..	..	..	..	..	..	..	E	E	E	E	..
Syr. Ferr. Lactophos.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS FERRI PROTOCHLORIDI	..	..	..	..	..	..	..	L	L	L	L	..
Syrup of Ferrous Chloride	..	..	..	..	..	..	..	S	S	S	E	..
Syrup of Protochloride of Iron	..	..	..	..	..	..	..	E	E	E	..	..
Syrup of Protochloride of Iron	..	..	..	..	..	..	..	..	..	..	S	..
Syr. Ferr. Protochlor.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS FERRI QUININÆ ET STRYCHNINÆ PHOSPHATUM	..	..	..	..	..	..	..	..	..	224	L	L
Syrup of Phosphatis of Iron Quinine and Strychnine	..	..	..	..	..	..	..	..	..	..	E	E
Easton's Syrup	..	..	..	..	..	..	..	..	..	..	..	S
Syr. Ferr. Quin. et Strych. Phos.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS FERRI SACCHARITI SOLUBILIS	..	..	..	..	..	..	..	L	L	L	L	L
Syrup of Soluble Saccharated Iron	..	..	..	..	..	..	..	E	E	E	E	E
Syrupus Ferri Oxydati Solubilis	..	..	..	..	..	..	..	S	S	S	S	S
Syrup of Saccharated Oxide of Iron	..	..	..	..	..	..	..	S	S	S	S	S
Syrup of Soluble Oxide of Iron	..	..	..	..	..	..	..	S	S	S	S	S
Syr. Ferr. Sacch. Sol.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS FICORUM COMPOSITUS	..	..	..	..	..	..	..	..	..	..	L	L
Compound Syrup of Figs	..	..	..	..	..	..	..	..	..	..	E	E
Syr. Ficor. Co.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUP OF GLYCYRRHIZÆ	..	..	..	..	..	..	..	L	L	L	L	L
Syrup of Glycyrrhiza	..	..	..	..	..	..	..	E	E	E	E	E
Syrup of Licorice	..	..	..	..	..	..	..	..	..	S	S	S
Syrup of Liquorice	..	..	..	..	..	..	..	S	S	..	..	..
Syr. Glycyrrhiz.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS HYPOPHOSPHITUM	..	..	..	..	..	..	..	225	225	L	..	L
Syrup of Hypophosphitis	..	..	..	..	..	..	..	..	..	E	..	E
Syr. Hypophos.	..	..	..	..	..	..	..	..	..	..	..	A
SYRUPUS HYPOPHOSPHITUM COMPOSITUS	..	..	..	..	..	..	..	L	L	226	L	L
Compound Syrup of Hypophosphites	..	..	..	..	..	..	..	E	E	..	E	E
Compound Hypophosphites	..	..	..	..	..	..	..	S	S	..	..	..
Syr. Hypophos. Co.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS IODOTANNICUS	..	..	..	..	..	..	..	..	..	..	L	L
Syrup of Iodotanni	..	..	..	..	..	..	..	..	..	..	E	E
Syr. Iodotan.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS IPECACUANHÆ ET OPII	..	..	..	..	..	..	..	L	L	L	L	L
Syrup of Ipecac and Opium	..	..	..	..	..	..	..	E	E	E	E	E
Syrup of Dover's Powder	..	..	..	..	..	..	..	S	S	S	S	S
Syr. Ipecac. et Opii	..	..	..	..	..	..	..	..	..	..	A	A
SYRUP OF KRAMERIÆ	..	..	..	227	227	227	227	227	227	227	L	L
Syrup of Krameria	..	..	..	..	..	..	..	..	..	..	E	E

224—See **SYRUPUS FERRI QUININÆ ET STRYCHNINÆ PHOSPHATUM**, U. S. P.
225—See **SYRUPUS HYPHOPHOSPHITUM**, U. S. P.
226—See **SYRUPUS HYPOPHOSPHITUM COMPOSITUS**, U. S. P.
227—See **SYRUPUS KRAMERIÆ**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
Syr. Kramer	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS MANNÆ	..	..	..	..	..	..	..	L	L	L	L	L
Syrup of Manna	..	..	..	..	..	..	..	E	E	E	E	E
Syr. Mann.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS MORPHINÆ COMPOSITUS	..	..	..	..	..	..	..	L	L	L	..	..
Compound Syrup of Morphine	..	..	..	..	..	..	..	E	E	E	..	..
SYRUPUS MORPHINÆ ET ACACIÆ	..	..	..	..	..	..	..	..	..	..	L	..
Syrup of Morphine and Acacia	..	..	..	..	..	..	..	..	..	..	E	..
SYRUPUS PECTORALIS	..	..	..	..	..	..	..	L	L	L	..	..
Syrupus Pectoralis	..	..	..	..	..	..	..	..	..	..	S	..
Jackson's Pectoral Syrup	..	..	..	..	..	..	..	S	S	S	S	..
Pectoral Syrup	..	..	..	..	..	..	..	E	E	E	..	..
Syr. Morph. et Acac.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS MORPHINÆ SULPHATIS	..	..	..	..	..	..	..	L	L	L	..	..
Syrup of Morphine Sulphate	..	..	..	..	..	..	..	E	E	E	..	..
Syrupus Morphinæ	..	..	..	..	..	..	..	S	S	S	..	..
Syrup of Morphine	..	..	..	..	..	..	..	S	S	S	..	..
SYRUPUS PAPAVERIS	..	..	228	..	..	..	..	L	L	L	L	..
Syrup of Poppy	..	..	..	..	..	..	..	E	E	E	E	..
Syr. Papaver.	..	..	..	..	..	..	..	..	..	..	A	..
SYRUPUS PHOSPHATUM COMPOSITUS	..	..	..	..	..	..	..	L	L	L	L	L
Compound Syrup of Phosphates	..	..	..	..	..	..	..	E	E	E	E	E
Chemical Food	..	..	..	..	..	..	..	S	S	S	S	S
Syr. Phos. Co.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS PHOSPHATUM CUM QUININÆ ET STRYCHNINÆ	..	..	..	..	..	..	..	..	..	..	L	L
Syrup of Phosphates with Quinine and Strychnine	..	..	..	..	..	..	..	..	..	..	E	E
SYRUPUS HYDROCHLORPHOSPHATUM	..	..	..	..	..	..	..	..	..	L	..	..
Syrupus Hydrochlorphosphatum	..	..	..	..	..	..	..	..	..	..	S	..
Compound Syrup of Hydrochlorphosphates	..	..	..	..	..	..	..	..	..	S	S	..
Compound Syrup of Phosphates with Quinine and Strychnine	..	..	..	..	..	..	..	..	..	E	..	..
Syr. Phosphat. c. Quin. et Strych.	..	..	..	..	..	..	..	..	..	..	A	A
SYRUPUS PINI ALBÆ COMPOSITUS	..	..	..	..	..	..	..	..	..	..	..	L
Compound Syrup of White Pine	..	..	..	..	..	..	..	..	..	..	..	E
SYRUPUS PINI STROBI COMPOSITUS	..	..	..	..	..	..	..	..	..	..	L	..
Syrupus Pini Strobi Compositus	..	..	..	..	..	..	..	..	..	..	..	S
Compound Syrup of White Pine	..	..	..	..	..	..	..	..	..	..	E	..
Syr. Pin. Strob. Co.	..	..	..	..	..	..	..	..	..	..	A	..
Syr. Pin. Alb. Co.	..	..	..	..	..	..	..	..	..	..	..	A
SYRUPUS PINI ALBÆ COMPOSITUS CUM MORPHINA	..	..	..	..	..	..	..	..	..	..	..	L
Compound Syrup of White Pine with Morphine	..	..	..	..	..	..	..	..	..	..	..	E
SYRUPUS PINI STROBI COMPOSITUS CUM MORPHINÆ	..	..	..	..	..	..	..	..	..	..	L	..

228—See **SYRUPUS PAPAVERIS**, U. S. P.

(*To be continued*)

EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

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RESEARCH ON PHARMACOPŒIAL PROBLEMS.

BY E. FULLERTON COOK, CHAIRMAN, COMMITTEE OF U. S. P. X.

Under the By-Laws of the Pharmacopœial Convention, the Executive Committee of Revision is "authorized to carry on research work and to make preparations for the ensuing revision." With the "Tenth Revision" completed, the Committee has turned to this next task so definitely assigned by the Convention.

As the first step, all members of the General Committee of Revision were called upon for information concerning difficulties of the revision which, in their opinion, were not yet satisfactorily solved and for other suggestions for needed research within the scope of the Pharmacopœia.

The responses from those who had so arduously worked during the "Tenth Revision" for the perfection of the text revealed many yet unsolved questions, and these were studied and classified by the Executive Committee of Revision in a conference held in New York City. That these selected subjects may be available for further consideration by the members of the Committee of Revision and by the many other research workers in the medical, pharmaceutical and chemical fields, they are herewith published.

For convenience they have been classified under five divisions, each division having the direction of the corresponding members of the Executive Committee of Revision, one member serving as Chairman of the group. The divisions are as follows: (1) Therapeutics and Pharmacology; (2) Chemistry; (3) Botany and Pharmacognosy; (4) Pharmaceutical Formulas and Processes and (5) Nomenclature, Tables and Miscellaneous Questions.

Additional copies of this list may be obtained by addressing the office of the General Chairman, E. Fullerton Cook, Chairman of the Committee of Revision of the U. S. Pharmacopœia, Tenth Revision, 636 South Franklin Square, Philadelphia, Pa., and any one desiring to undertake the study of one or more of the problems suggested or of assisting in one of the coöperative studies which are outlined is requested to address the Chairman of the group having charge of that particular study or to write to the General Chairman of the Committee of Revision.

It is very important that those undertaking these researches should indicate their intention to the Committee of Revision, that a record may be had of all proposed studies and that such assistance as is available may be extended.

It is understood, of course, that all such voluntary studies may be presented and published wherever and in whatever manner the author may desire, only that the facts may be available for consideration during the next revision.

THE U. S. P. COMMITTEE ON THERAPEUTICS AND PHARMACOLOGIC RESEARCH.

H. C. WOOD, JR., CHAIRMAN, WITH C. W. EDMUNDS, GEORGE W. MCCOY AND TORALD SOLLMANN.

1. Iron Citrate Solution for Hypodermic Use. It is desirable to know the composition of commercial iron citrate solution sold for hypodermic use, and then to devise satisfactory standards for the solution.

2. Stainless Iodine Ointment. Is "stain-

less" ointment of iodine (as Ung. Iodi Denigrescens N. F.) equivalent to the U. S. P. ointment? The following should be studied:

a. Determine absorbability of iodine through skin.

b. Which ointment is best absorbed?

c. Are the antiseptic qualities of the two ointments identical?

(Iodine Petroxolin, N. F., might also be included in this study.)

3. Ointment of Belladonna. Is the U. S. P. X formula suitable for absorption through the skin? Physiological tests should be made on human beings and on animals.

4. Mercurial Ointments. It is desirable to study and report on the relative efficiency of mercurial ointments as made with different fatty bases. This study may advantageously be extended to other official ointments.

5. Cimicifuga. Is Cimicifuga therapeutically useful? A report is desired covering:

a. Opinions of clinicians who have used it.

b. Experimental clinical study.

6. Gelsemium. This drug has been dropped from the U. S. P. It has been suggested that it should be restudied for evidence of its therapeutic value.

7. Lobelia. A restudy of the therapeutic value of this drug is considered desirable.

8. Cannabis. Is this drug worthy of retention in the U. S. P? If so, clinical tests should be conducted to indicate the comparative value of Indian and American Cannabis, and also the rapidity of deterioration in the drug and its preparations.

9. Bacterial Vaccines. Which of these are worthy of U. S. P. recognition?

10. Infusion of Digitalis and Tincture of Digitalis. A study should be made of the potency of the infusion and tincture of digitalis made by various methods.

11. Cascara. The U. S. P. X demands that cascara be aged before use in medicinal preparations. This practice has been generally followed by manufacturers for a long time, but is it based on accurate information? If the literature does not reveal that tests have definitely proved the advantage of aging it would be desirable to investigate the question.

12. Oil of Santal. It is desirable that an investigation be made of the chemical and therapeutic properties of the commercial oils of sandalwood.

13. The Assay of Veratrum Viride. A satisfactory bio-assay for veratrum viride should be devised.

14. The Assay of Ergot. A study of the U. S. P. X assay methods in comparison with other bio-assay methods for ergot is recommended.

15. The Assay of Digitalis, Its Preparations and the Digitalis Groups. The U. S. P. method for standardizing the heart tonics of the digitalis series should be further studied. One problem is the growing difficulty in obtaining frogs in sufficient quantity. Can a colorimetric or chemical method be devised to take the place of the biological method?

16. Oleoresin of Male Fern. A study of the biological and also chemical assay of Oleoresin of Male Fern is desirable, with a consideration of introduction into the U. S. P.

17. Biological Assays. All bio-assay standards tentatively adopted by the Second International Conference on Biological Standardization should be tried in comparison with those of the U. S. P. X.

18. Cod-Liver Oil. The methods for determining the antirachitic value of this and other related oils are important, and U. S. P. workers should coöperate with other investigators in this field.

19. Strophanthin. Strophanthin, being a mixture of glucosides, varies in toxicity on frogs when tested by the U. S. P. method for heart tonics. Variations have been reported in strophanthin from Strophanthus Kombe of from 0.00,000,05 Gm. per Gm. frog (equal to ouabain) to 0.00,000,1 Gm. per Gm. frog. Is it desirable to include in the U. S. P. a biological test such as is given for strophanthus, allowing for a certain range? The U. S. P. X recognizes strophanthin from *S. Kombe* only. The question has been asked: Why not from *S. hispidus* also? They should be studied for comparison.

20. Pituitary Solution. This solution is sometimes prepared with dilute acetic acid or other acid. This is not recognized by the U. S. P. X. Is acid necessary? If so, suitable limits should be set, but if not required the U. S. P. text should forbid its addition.

21. Ether and Chloroform. Are the U. S. P. X standards sufficiently rigid for the requirements of anesthesia? The labeling of manufacturers would imply that such was not the case. As the medicinal use of both ether and chloroform is principally for anesthesia, the U. S. P. specifications should recognize only the highest purity commercially possible.

A commission of authorities should study this question.

22. Sulphur Ointment. The use of petrolatum is suggested instead of lard in this ointment. It is claimed to produce a better-appearing and smoother ointment, but will it be equally efficient therapeutically? This will require a clinical study.

23. Boric Acid Ointment. Is the U. S. P. X formula superior to that of the U. S. P. IX? A number of clinicians should be invited to use these two ointments and report comparative results.

(*To be continued*)

PERSONAL AND NEWS ITEMS.

The AMERICAN PHARMACEUTICAL ASSOCIATION is indebted to **Dean William B. Day** for the gift of several unbound volumes and quite a number of single copies of the JOURNAL which complete several volumes. Appreciation is expressed for the thoughtfulness which prompted the donation and thanks extended for the gift.

Chairman E. Fullerton Cook, of the Revision Committee of U. S. P. X, has donated a complete set of the Circular Letters, etc., of the recent revision to the AMERICAN PHARMACEUTICAL ASSOCIATION. The thanks of the ASSOCIATION are tendered the Committee and the Board of Trustees.

E. G. Eberhardt, of Eli Lilly & Company, advises that he has received an historic pill-coating machine, historical documents and other matter for the ASSOCIATION, and promises to add to this collection. The helpfulness of our fellow member is appreciated.

George A. Gorgas, of Harrisburg, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1884, celebrated the fiftieth anniversary of his entry into the drug business, on his own account. The day was marked by congratulations of patrons and of the employees of the four stores of the George A. Gorgas Drug Company.

Pharmacist **F. A. Grazer,** of the Sacramento Hospital, Sacramento, Calif., is convalescing. He has been seriously ill.

Secretary E. L. Newcomb, of the N. W. D. A. and Publicity Director of the Campaign Committee, A. PH. A. Headquarters Building, was one of the principal speakers at the meeting of the Minnesota Pharmaceutical Association.

A. L. Buzzell, editor of the *Bulletin of Pharmacy* for about a decade, is now the editor and publisher. It is hoped that the publication will continue to grow in usefulness. **Walter M. Chase,** whose activities at the annual meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION have been very helpful has discontinued his editorial work on the *Bulletin* and assumed a position of responsibility with Parke, Davis & Co. Best wishes are extended to both Mr. Buzzell and Mr. Chase.

TSCHIRCH MEMORIAL VOLUME.

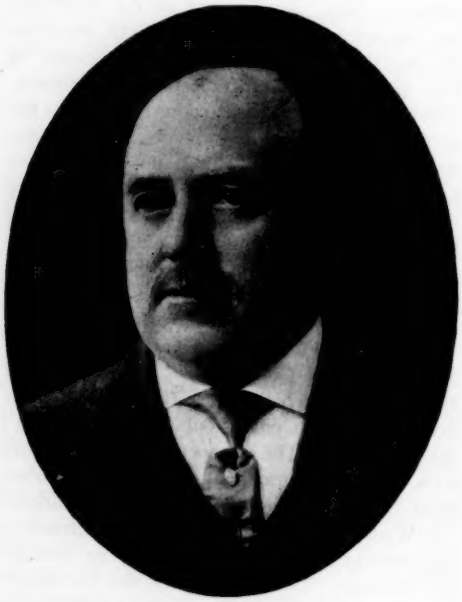
Festchrift für Alexander Tschirch. $10^1/_2''$ x $7^1/_2''$, 460 pages. Publisher Chr. Herm. Tauchnitz, Leipzig. This volume, in memory of the seventieth anniversary of Dr. A. Tschirch, contains 56 original papers by contributors of note, and the volume is dedicated to him. An account of the festivities on the occasion of the seventieth birthday of Dr. Tschirch will be found in several of the preceding numbers of the JOURNAL. Thirteen countries are represented by the contributors and the subjects concern the work in which Dr. Tschirch has been active and prominent during many years. The preface to the book was prepared and written by Prof. Dr. H. Thoms and a number of the titles of the contributions follow: "The Determination of Santonin in Wormseed" (H. Feckurts); "The Laxative Action of some Sugars" (H. Fühner); "How Are Alkaloids Produced?" (J. Gadamer); "The Sources of the Oldest Herbals" (F. Homel); "Some Non-Alkaloidal Constituents of Ipecacuanha" (O. Keller); "The Importance of Hamburg as a Leading Commercial Center and Harbor with Special Reference to Its Drug Market" (G. Weigel); "A Method for the Quantitative Determination of Essential Oils in Drugs" (J. Stamm); "Greek Liquorice and Its Juice" (E. Emmanuel); "Aspergillus Flavus in Blocked Fresh Lac; "East Indian Balsam of Tolu and West Indian Balsam of Peru" (L. van Itallie, W. J. van Eerde and A. Harmsma); "The Distillation of Essential Oils with Superheated Steam" (P. van der Wielen and A. H. W. M. Hermans); "The Therapeutic Importance of Drugs" (E. Bürgi); "Studies on Hashish" (P. Casparis); "The Antigen Properties of Lipoids" (G. Sobernheim); "Colorimetric Assays and Standardized Colored Fluids" (H. V. Arny, in English).

The work contains several tables and illustrations, among the latter a picture of Dr. Tschirch.

OBITUARY.

HERMANN ENGELHARDT.

Hermann Engelhardt, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1905, died at his home in Baltimore on February 9th after a short illness. The deceased was born in Braunschweig, Germany, in 1863, where he received his early education in the private schools of that city. In 1882, he entered the University of Göttingen and later he attended the University of Leipzig and the Polytechnic Institute of Braunschweig. He earned his degree of Doctor of Philosophy at the University of Erlangen in 1888. Following a number of years of service as a chemist in Hesse Dr. Engelhardt came to the United States, in 1895, and engaged with Sharp and



HERMANN ENGELHARDT.

Dohme of Baltimore. At the time of his death he was head of the Analytical Department.

Dr. Engelhardt was a most conscientious worker; modest in the estimate of his own qualifications, and ever ready to give his time to the service of pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION. He is survived by his widow, Mrs. Erna Engelhardt and a daughter, Miss Minette Engelhardt. His mother and two sisters in Braunsweig, Germany, also survive the deceased.

The funeral services were largely attended by friends, members of the firm of Sharp and Dohme and of the AMERICAN PHARMACEUTICAL ASSOCIATION.

GEORGE JAMES WAUGH.

George J. Waugh, formerly of Stratford, Canada, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1862, died at Santa Monica, after a brief illness.

Mr. Waugh was born in Hamilton, Canada, 86 years ago, and here he received his earlier education. He graduated from the New York College of Pharmacy in 1862, and during the following year established a drug store in Stratford which he continued for many years, up to the time of his removal to California.

He was one of the founders of Ontario College of Pharmacy, in 1879, and for some time an officer of the institution. The deceased attended a number of the annual meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION, of which he was a Life Member.

EDWIN W. GROVE.

Edwin W. Grove, founder of the Paris Medicine Company, St. Louis, maker of a line of proprietary medicines, died January 27th of pneumonia at Asheville, N. C., where he had spent much of his time since 1897. He was 76 years old.

Born on a Tennessee farm, Mr. Grove worked as a boy in a drug store. Later, as a pharmacist he evolved formulas for a chill tonic and a cold tablet which brought him great wealth. He had extensive real estate interests in the vicinity of Asheville.

THE IMPORTANCE OF RESEARCH.

Secretary of Commerce, Herbert Hoover, at a banquet to celebrate the founding of the U. S. Bureau of Standards (December 4th), said the fact impressed him "that we are a people of 110 million on a continent where we have already developed the large proportion of our national resources, a population growing at a rate that we must face in the next fifty years, doubling up to perhaps two hundred million people. We must face the solemn economic fact that unless we develop through science the greater utility of our resources, expand by discovery their usefulness, we cannot maintain the standards of living of that vast increment of population to those standards that we now enjoy."

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Tennessee.—Joseph F. Voigt, Chattanooga.

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Washington.—Henry E. Holmes, Seattle.

West Virginia.—William E. Weiss, Wheeling.

Wisconsin.—Charles Beyschlag, La Crosse: Edward Kremers, Madison; Henry C. Schranck, Milwaukee; Charles C. Sniteman, Neillsville.

England.—Henry S. Wellcome, London.

Syria.—Traintaphyllo Ladakis, Beirut.

DRUGGISTS' RESEARCH BUREAU ORGANIZED.

Reference has been made in an editorial of this issue on the Druggists' Research Bureau. The meeting of this recently organized body was held on January 17th at the offices of the National Wholesale Druggists' Association, in New York City. A. K. Mayer, Chairman of the Committee on Education and Research of the N. W. D. A. was elected *Chairman* of the Bureau; James F. Finneran of Boston was elected *Vice-President* and E. L. Newcomb *Secretary*. The Committee directing the affairs of the Bureau is composed of Ambrose Hunsberger, Philadelphia; J. F. Finneran, Boston; A. W. Pauley, St. Louis; Paul C. Olsen, Philadelphia; George B. Evans, Albany; H. S. Noel, Indianapolis; J. T. Woodside, Chicago; Sidney Hollander, Baltimore and A. Kiefer Mayer, Indianapolis.

PHILADELPHIA DRUG EXCHANGE.

The sixty-sixth annual meeting of the Philadelphia Drug Exchange was held January 25th, in its rooms in the Philadelphia Bourse Building. Annual reports were read. The election for officers and directors resulted as follows: *President*, Herbert R. McIlvaine; *Vice-President*, John F. Belsterling; *Secretary*, Joseph W. England; *Treasurer*, A. L. Hilles, Jr. Board of Directors: C. Mahlon Kline, C. Dunning French, Benjamin S. Thorp, H. K. Hineline, Harrison S. Hires, F. L. Bodman, Walter V. Smith, Milton Campbell.

The annual dinner of the exchange was held at the Bellevue-Stratford Hotel the evening of January 27th.

OFFICERS OF THE NATIONAL DRUG TRADE CONFERENCE.

The following officers were elected at the December meeting of the National Drug Trade Conference: Samuel C. Henry, Secretary of the N. A. R. D., *President;* H. C. Christensen, Secretary of the National Association of Boards of Pharmacy, *Vice-President;* E. F. Kelly, Secretary of the A. PH. A., *Secretary*. Executive Committe: James H. Beal, representing the AMERICAN PHARMACEUTICAL ASSOCIATION; C. Mahlon Kline, the National Wholesale Druggists' Association; Harry Noonan, the American Pharmaceutical Manufacturers' Association; Harry B. Thompson, the Proprietary Association; Carson P. Frailey, the American Drug Manufacturers' Association; E. F. Kelly, the American Association of Colleges of Pharmacy; H. C. Christensen, the National Association of Boards of Pharmacy; Samuel C. Henry, the National Association of Retail Druggists.

DRUG CONTACT COMMITTEE HAS TWO-DAY SESSION.

The Joint Contact Committee of the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association met in Washington Monday and Tuesday to consider tolerances and assay methods for a list of compressed tablets. In accordance with the usual custom the closing session, Tuesday, was held with officials of the United States Bureau of Chemistry.

J. Paul Snyder, chairman of the Contact Committee of the American Drug Manufacturers' Association, presided over the sessions and Charles E. Vanderkleed acted as Secretary. R. Lincoln McNeil is chairman of the Contact Committee of the American Pharmaceutical Manufacturers' Association.

BALTIMORE DRUG EXCHANGE NAMES 1927 COMMITTEES.

The President of the Baltimore Drug Exchange Bureau of the Baltimore Association of Commerce has appointed standing committees which carry on the active work during the year. The chairmen of these committees are as follows: Auditing, K. M. G. Pierpont; Credits and Collections, W. R. Mealy; Legislation, Richard H. Bond; Membership and Entertainment, J. Emory Bond; Public Improvement, Dr. A. R. L. Dohme; Publicity, George M. Armor; Taxation, Parker Cook; Transportation, James Baily.

BALTIMORE RETAIL DRUGGISTS' ASSOCIATION OFFICERS.

The following are the officers of Baltimore Retail Druggists' Association: *President*, R. E. L. Williamson; *Vice-Presidents*, S. Y. Harris, W. G. Lauer, H. W. Allen and L. S. Williams; *Secretary*, M. Strasburger; *Recording Secretary*, W. H. Kratz; *Treasurer*, P. J. Boenning. The annual banquet will be held March 3rd.

LEGISLATIVE POSSIBILITIES REQUIRE VIGILANCE AND PROMPT ACTION.

"It is not alone toward Congress that business must turn watchful eyes and direct emphatic protests, in order that its rights may be preserved from engulfing waves of fanaticism or from the vagaries of political expediency. Legislatures are in session, or shortly will be, in most of the States, and the periodical folly of the duly elected lawmakers of the various commonwealths is again to be guarded against.

"Reform, as essayed in the formulation and projection of legislative measures, is a peculiar thing. It is aimed hither and thither, with fine disregard for whatsoever rights may lie in the way of its goal. And it is just as likely to turn about and take up the other side of any matter as it is to proceed in the direction with respect thereto, which appeared to be the purpose of the inauguration of the movement. Congress has shown more than one tendency to reverse its apparent purpose in the present session. Congressional ideas spread rapidly to the stars of lesser magnitude who occupy the State lawmaking firmaments, and it is to be expected that, insofar as State's rights permit, a similar attitude toward business problems obtains especially with regard to the matter of the bootlegging industry, in the State legislatures.

"It is not a fact, unfortunately, that State legislatures do not evolve ideas of their own, more in keeping with their authority, relative to what is good for business as a part of the economic commonwealth. Evidence of this has already begun to accumulate in the records of legislative procedure. In Texas, for example, an impressive movement will require paints and cognate products to be labeled with certain information. The purpose of this may be commendable, but the statutory provisions by which it is sought are, as is quite usual, disregardful of property rights. A bit of work of revision, at least, is called for.

"In Massachusetts a movement, represented in a bill in the House is under way to safeguard the users of cosmetics. All sorts of preparations are embraced within the provisions of this bill, applications for the hair, for the skin, and for the nails, dentifrices, and all other embellishing, cleansing, perfuming and reconditioning agents. The bill goes far with respect to what is an adulterant in such preparations and in its requirements as to what constituents must be disclosed on the label. It offers, at least, grounds for a deal of difference of opinion.

"The Missouri Legislature has under consideration a bill to require labeling of drugs of coal-tar origin, alone or in compound preparations. It requires all such articles to be labeled with "true English name" and a statement of origin. It prohibits the sale of any such drugs to minors. The range of application and effects of coal-tar drugs is so wide that this bill is unnecessarily stringent. It, also, calls for some repair work on its phraseology, if not, in truth, for a "stop" order.

"These are but a few examples of the latest trend in legislative thought. They are typical, but they are not of the worst to be expected. Vigilance is the first essential in the combating of inimical legislation. Prompt, coördinated opposition is the most necessary procedure."—From an editorial of the *Oil, Paint and Drug Reporter*.

1927 BRITISH PHARMACY SHOW.

The thirty-second chemists' exhibition, organized by the *British Colonial Pharmacist*, will be held in Holland Park Hall, London, W., May 9th to 13th. It is said the exhibition will be the largest yet held.

BOOK NOTICES AND REVIEWS.

United States Dispensatory. Twenty-first Edition, thoroughly revised, largely rewritten, and based upon the tenth revision of the United States Pharmacopœia, National Formulary Fifth Edition, and the British Pharmacopœia 1914. By Horatio C. Wood, Jr., M.D., Professor of Pharmacology and Therapeutics in the University of Pennsylvania, Professor of Materia Medica in the Philadelphia College of Pharmacy and Science, Member of the Committee of Revision of the Pharmacopœia of the United States of America; Charles H. LaWall, Ph.M., D.Sc., Phar.D., Professor of Theory and Practice of Pharmacy in the Philadelphia College of Pharmacy and Science, Member of the Committee of Revision of the Pharmacopœia of the United States of America; Heber W. Youngken, Ph.M., Ph.D., Professor of Botany, Pharmacognosy and Materia Medica in the Massachusetts College of Pharmacy, Member of the Committee of Revision of the Pharmacopœia of the United States of America; John F. Anderson, M.D., Member of the Committee of Revision of the Pharmacopœia of the United States of America; Ivor Griffith, Ph.M., Assistant Professor in Pharmacy in the Philadelphia College of Pharmacy and Science. Buckram, 7 by 10¼ inches; pages xxx, 1792. Philadelphia and London: J. B. Lippincott Company, 1926. Price $15.00; with Thumb Index, $15.75.

It is rather difficult to review this comprehensive work, with which all pharmacists are acquainted. It is the only American Dispensatory which has been revised in accordance with the latest issues of the U. S. Pharmacopœia and National Formulary. This edition has been thoroughly revised; much old matter has been condensed so that the new subjects have not increased the number of pages. The authors as well as the publishers are well and favorably known and this work represents the result of earnest efforts in keeping the U. S. Dispensatory up-to-date.

A Textbook of Pharmacognosy. Second edition, revised and enlarged; 201 illustrations, containing about 600 figures. By Heber W. Youngken, A.M., Ph.M., Ph.D., professor of Pharmacognosy and Materia Medica in the Massachusetts College of Pharmacy. 700 pages. Price $6.00.

The author of this book is highly regarded as an authority by pharmacists everywhere; the fact that he served as Secretary of the Section on Pharmacognosy of the recent International Congress of Plant Sciences speaks for his acquaintance among foreign scientists. It would be an easy matter to outline the activities of Dr. Youngken, for his efforts have been directed to advance the importance of pharmacognosy in colleges of pharmacy and among the sciences. The value of his contributions to pharmaceutical literature and to the proceedings of the sections of the AMERICAN PHARMACEUTICAL ASSOCIATION have received favorable notice, and recognition by the award of the Ebert Prize.

The author was prompted to prepare the first edition of this book by a desire to supply a systematic text which could be used by students of pharmacognosy in colleges and universities where the science of pharmacognosy is taught either from the morphologic or taxonomic viewpoint or from both, hence, that volume was arranged in two parts: "Morphologic Consideration of Crude Drugs" and "Taxonomic Consideration of Crude Drugs." The further aim of the author was to have the book serve the drug analyst, pharmacognosist, retail and wholesale pharmacist and collector of crude drugs.

The present volume was made necessary because of the revisions of the U. S. Pharmacopœia and National Formulary. The chapters of the former edition have been added to by the incorporation of the more important uses of drugs and new data on the drying, sampling and examination of crude drugs. The volume has been made more valuable by more than 150 pages of new subject matter and nearly 100 illustrations. The press work and binding is good and the paper heavy of good finish, whereby the details of the halftones and drawings are brought out. The text shows careful proofreading.

Indicators. Their use in quantitative analysis and in the colorimetric determination of hydrogen-ion concentration. By Dr. I. M. Kolthoff, Conservator of the Pharmaceutical Laboratory of the State University, Utrecht. Authorized translation by N. Howell Furman, Ph.D., Assistant Professor of Analytical Chemistry, Princeton University. John Wiley & Sons, Inc., 270 pages, price $3.50.

Dr. Kolthoff is known to the readers through his contributions to the chemical and pharmaceutical literature, and also through the personal contact with members at the Buffalo meeting of the A. PH. A.

The volume under review is the second edition; the first was published in 1921. In the Preface of the latter the author points to the fact that the suitability of an indicator is dependent upon the properties of the acids or bases in question, hence, the process of neutralization is discussed at length at the very beginning of the treatise, followed by a consideration of the relation between the color change of an indicator and the hydrogen-ion concentration, and the use of indicators in neutralizations. A brief theoretical résumé is given of the underlying causes of color changes in the last chapter of the book. The author succeeded in his purpose to present a practical manual, the plan of which has been followed in the preparation of the second edition. A new chapter deals with amphoteric compounds from the standpoint of the modern conceptions of Bjerrum. The translator, Dr. N. Howell Furman, names the following among the noteworthy additions: "Data on new sulphone phthalein indicators, further explanation of the behavior of methyl orange and methyl red, description of a new set of buffer mixtures that can be prepared without the use of standard acid or base (weighed salts or acids are used), an improvement of the double-wedge method (instead of standardizing the apparatus for one indicator it is so constructed that the ratio between the acid and alkaline form of an indicator may be read off), extensive new data on the salt error, new material dealing with measurement of p_H in alcoholic solutions, revision of the section on distilled water." The translator has added author and subject indices, which add to the usefulness of the volume. The name of the well and favorably known author commends his work.

Gould's Medical Dictionary. By George M. Gould, A.M., M.D. Edited by R. J. E. Scott, M.A., B.C.L., M.D. P. Blakiston's Son & Co., Philadelphia. Limp leather. Price $9.00.

The first edition of Gould's Dictionary was published in 1890, successive editions appearing at irregular intervals. The edition under review contains approximately 76,000 words, of which about 5000 are new. The present volume is printed in larger and bolder type than former ones; many illustrations are included and half-tones of medical men of prominence with biographical data have been added; also considerably more tabular matter.

Eponymic terms are placed in alphabetical order; the plan and scope of former editions have been followed, except where a change was deemed an improvement; the spelling conforms to standard requirements; the definitions are as terse as possible and still convey the meaning. The pronunciation is shown by a phonetic arrangement of letters.

The Editor after referring to constant word coinage divides the new words into three classes: those which express new ideas, inventions or discoveries—they represent the smallest number, but most important; they represent new words, in fact. The next class is chiefly composed of eponymics, defining some one's test, operation, etc. The third class is very much larger than the preceding and includes names of new remedies. Dr. Scott makes a weighty statement which should have wide recognition and universal application: "No name should be changed simply because it is inappropriate." This is applicable also to definitions. Greatest care should be exercised in selecting and accepting a new name or definition, for when these are once established a change causes confusion and is a source of possible danger; editorial comment was made in the January number of THIS JOURNAL anent the change of definition for "antiseptic."

Interesting notes concerning the history of lexicography from the Preface to Gould's "A Dictionary of New Medical Terms" are made part of the Preface of this edition. Every revision of this Dictionary has been an improvement on its predecessor and, therefore, the writer takes the liberty of suggesting that consideration be given to the inclusion of a biographical index and more half-tones of men who have contributed to the progress of medicine; it is probably unnecessary to say that the pictures should be of those who have ceased their labors, and American physicians and scientists should not be overlooked.

A pharmacy library is incomplete without a Medical Dictionary.

Chemical Synonyms and Trade Names. By William Gardner. Third edition, 10 x 6¼ inches. IX + 355 pages. D. Van Nostrand Company, New York. Price $7.50.

The second edition of this work was reviewed in these columns last year. The appearance of a third edition after the lapse of about two years speaks for the usefulness of the book; while largely an index of chemical

synonyms and trade names it is a dictionary as well. The definitions are concise but contain essential information. There are included about 2000 definitions and cross references in the volume under review. In nearly all instances the definitions are applicable to terms used in the United States, but there are exceptions; as an example, under "Alcohol, denatured," reference is made to "Methylated Spirit," by which name it is generally known in Great Britain, but not in U. S. Formulas for denatured alcohol could have been added, *i. e.*, by reference to circulars or otherwise. The same criticism applies to some other terms, or an explanation should be made somewhere, indicating that the strength given is that of the British Standard—this is done in several places. Comparatively few in this country would look for "Paraffin, liquidum." There seems to the reviewer a way of correcting this and, therefore, attention is called. It might here be mentioned that about forty brand names are given under the heading quoted. A number of rather unimportant extracts are defined, but no fluidextracts. Coöperation of users is aiding in the improvement of this valuable dictionary.

A few typographical errors occur—"jequirty" should be "jequirity" and "pecatorius" should be "precatorius;" in turning the pages several other misspellings were noted, but at this moment these are not recalled. Some of the definitions have not received careful consideration—"oil of cinnamon" is said to be cinnamic aldehyde. "Oil of Been" is stated to be a product of "*Moringa aptera*," should be *M. arabica* and, as "Oil of Benne" is much more frequently used than the former, attention should be called to the fact that the foregoing is not the product of *Sesamum indicum*. A number of lines of references and of definitions could be omitted; for example "Kola Nut" is followed by Kola seeds, a term given under the former.

The book is valuable for chemists and druggists as a dictionary and reference book; it is well printed and bound.

The Modern Soap and Detergent Industry. Volume III. The Manufacture of Glycerol. By Geoffrey Martin. 264 pages. D. Van Nostrand Company, 8 Warren St., New York. Price $12.00.

The "Preface" states that "this volume on Glycerol completes the work on the Soap and Detergent Industry. In it will be found practical details of modern plants and processes, such as will be found in no other work published at the present time. In addition to this, there have been given all the more important patents on glycerol and a great many of the older ones, so that the reader can follow the lines of thought running through the minds of a long series of inventors, and possibly improve thereon. For the same reason references are given to the original literature, as nothing is more instructive for the reader than to read through original papers. He thereby attains an insight into the difficulties of manufacture and a freshness of view which is impossible to impart in any short summary of the work."

Acknowledgment is made for assistance by practical men employed in the related industries and by various firms—all of them seem to be British manufacturers. The author also thanks Messrs. J. & A. Churchill, Ltd. (London) for leave to use certain tables which appeared in Allen's "Commercial Analysis." In taking the latter reference from the "Preface" the misspelling, Allan, was noted—"a" instead of "e."

A. C. Langmuir has reviewed the volume for *Industrial and Engineering Chemistry*. He states that this is the only work in the English language devoted entirely to the subject (the manufacture of glycerol) and compares very favorably with Deite-Kellner's "Das Glyzerin" (1923) which has *not* been translated.

The portions quoted from the "Preface" indicate the reason for extended quotations from other publications—so as to collate information on the subject. Mr. Langmuir also calls attention to the fact that the F. J. Wood distillation process is given little space in the volume reviewed and that more than 150 million pounds are produced by this process in the United States. Attention is also called to a descriptive article in *Trans. Am. Inst. Chem. Eng.*, 5, 261 (1909), which Dr. Martin probably overlooked. It is stated that the patent rights of this described refining process will soon expire.

The Book is divided into six sections, comprising 33 chapters. The sections deal with the manufacture of crude undistilled glycerol, the manufacture of distilled glycerol, miscellaneous methods of producing glycerol, properties, technical applications and statistics of glycerol; polymerized glycerol and glycerol substitutes; commercial valuation

and analysis of glycerol. The index of authorities covers nine 3-column pages and the index of subjects forty-five 2-column pages.

The type, illustrations, paper and press work is good and the book is necessary for the technical library and for the industries in which glycerol is an important item.

A Textbook of Physiology. By William Zoethout, Ph.D. Second Edition. 616 pages, $5^1/_2$ x $8^1/_2$ inches, with 186 illustrations. Price, cloth, $4.50. C. V. Mosby Company, St. Louis, Publishers.

The author states in the Preface that the book is intended to fill the gap between the larger texts and the brief treatises on physiology. References are made to the former books for those who seek a deeper knowledge of the subject and thus the author holds his treatise down to a comparatively small volume, which serves admirably as a text in dental and pharmacy schools. The author begins with the study of the characteristics of protoplasm and ferments and proceeds to tissues, cellular exchange, muscle-nerve physiology and the interrelationship of the organs.

The blood—general properties, composition—its circulation, etc., receives consideration in about 100 pages of text matter. This important subject is followed by chapters on Gas Exchange; Respiration; Foods, Digestion, Absorption, Movements of the Alimentary Canal, Metabolism, Animal Heat, Diet, Internal Secretions, the Kidneys, the Skin, the Receptors, or Sense Organs; the Central Nervous System; Reproduction.

Both the table of contents and index are well arranged for ready reference. The author has made the volume both interesting and instructive and succeeded well in presenting the fundamentals of physiology without overburdening the student with theories. It seems to the writer that the book is well suited for pharmacists and students of pharmacy.

The mechanical work is good—the type clear, most of the illustrations serve the purpose well and the paper and binding are good.

Drug Store Business Methods, a textbook on Commercial Pharmacy. By Charles W. Pearson, Associate Professor of Commercial Pharmacy at the Massachusetts College of Pharmacy. 300 pp. Price $2.75. Lea & Febiger, Publishers, Philadelphia.

The author has been successful in the treatment of his subject by presenting principles and practices that are applicable to everyday business activities. A definition of "commercialism" as the maxims and methods of commerce or of commercial men, and strict business principles is proper and acceptable; however, there is something about the term "commercial pharmacy" which is not pleasing to some; therefore "a textbook on Commercial Pharmacy" might have been omitted, for it may be questioned whether the definition is more specific than the title. This, however, is a small matter compared with the able manner in which the author has presented his subject. The book is divided into five parts and 45 chapters.

The first part of "Drug Store Business Methods" deals with sales and the customer, the second part with methods of bringing goods and service to the attention of the patron and prospect, the third part to proper recording of business transactions, the fourth division to the laws of business conduct and the fifth is given to more or less of a résumé and business management.

In the chapter on Salesmanship the author goes into the usual details. He might, perhaps, have written at greater length on health, neatness, cleanliness, address, as essentials in salesmanship—qualities that are differentiating marks of distinction. A natural, easy manner is more appreciated by the average patron than fulsome attention. These points are ably presented in the chapter on "Personality," in fact the part serves as an excellent introductory for this useful book.

The various means and methods of advertising are given due consideration; however, the author might have said more about wasteful and faulty advertising and objectionable methods of publicity. The illustrations of window displays could have been improved upon and it might have been well to include a professional window or two, especially now that there is a "Pharmacy Week" to be featured.

The part devoted to Accounting is good and gives the reader an opportunity to judge his own methods or improve on them.

While the part in which laws applying to the drug business are considered is brief, the essentials given are helpful and it also suggests their importance.

Part V, Store Management, includes more pages than other sections of the book. Herein the author discusses problems of store location, beginning and organizing the business, banking

and insurance, purchasing, the importance of stockkeeping and taking, and concludes with further consideration of sales methods, increases and general business policies.

The book outlines methods for teaching business management and a number of the divisions end with a general question or two on the subject which has received consideration in the preceding chapter. It is also a useful guide for the pharmacist. The author has been successful in his effort and the publishers have shown skill and care in the production of the book.

Annual Reports of The American Medical Association Chemical Laboratory. 199 pages, illustrated. Press of the American Medical Association, 535 N. Dearborn St., Chicago. Paper $1.25.

Information of value and interest is contained in the annual reports of the Chemical Laboratory, A. M. A. The text of the booklet has three divisions. Part I opens with an address by Dr. Paul Nicholas Leech, Director of the Laboratory, delivered before the American Pharmaceutical Manufacturers' Association, on "Chemistry in the Service of Pharmaceutical Medicine."

This is followed by contributions from the Laboratory; among these is an article by L. E. Warren on complex bismuth tartrates, published in the JOURNAL A. PH. A. for June 1925.

Other articles deal with examination of brands of cinchophen and of some liquid petrolatum agar emulsions, etc. Part II is largely made up of reprints of reports which have appeared in the *Journal A. M. A.* This part is of interest because of the investigations made of market preparations advertised to the public. The first article of Part III relates to the new quarters of the A. M. A. Chemical Laboratory, with two full-page illustrations of the interior. Investigations of tribasic calcium and magnesium phosphates are reported on, including specifications of their properties, tests for their identity and purity. Other reports are concerned with carbohydrate in certain "Diabetic" flours. A type cleaner is stated to consist of a suspension of paraffin in a saturated solution of paraffin in benzene.

The foregoing Book Notices and Reviews by E. G. E.

As customary, the well known publisher Julius Springer, Berlin, W. G. brought out his annual Pharmaceutical and also Chemical Almanac.

Pharmazeutischer Kalender 1927, Herausgegeben von Ernst Urban, 56 Jahrgang Mk 9.

As early as 1860 the Master of Pharmacy, Dr. Hermann Hager, published the first edition of the Pharmazeutischer Kalender für Norddeutschland, therefore the present edition is actually the 67th issue. It consists of three handy volumes: Part I. Diary. Part II. Handbook. Part III. Directory. The Handbook of 536 pages contains a mine of valuable information for both prescription counter as well as laboratory, as can readily be seen from the following headings: Prescription Abbreviations, Rules for Dispensing, Berlin Formulary, Maximum Doses, Tables for Alcohol, Acids, Alkalies, etc., Alkaloid Content of Drugs, Fluidextracts, Extracts and Tinctures, Poisons and Antidotes, etc.

The American pharmacist could profit greatly by getting acquainted with this Pharmaceutical Calendar.

Chemiker-Kalender 1927; founded by Dr. Rudolf Biedermann; revised by Prof. Dr. Walther Roth. 48th year. Price Mk 16.50.

The Chemiker-Kalender is similar in make-up to his older brother the Pharmazeutischer Kalender and also consists of three parts: Diary and the most important Laboratory Tables, Specific Gravities, Solubilities and Analysis. In this volume I beg to call special attention to the excellent chapter on Physiological Chemistry, including practical methods for the analysis of urine, blood, stomach contents, ferments, etc.

The Theoretical Part, contains chapters on Minerals, Crystals, Physics and Physical Chemistry, including Optics, Radioactivity, Electrochemistry, Colloidchemistry, etc. This volume also contains a complete Index for the three parts. It is, however, to be regretted that the chapter on "Historical Dates" has been omitted, as no doubt it is not only interesting but valuable to some of the users of the Kalender.

The Chemiker-Kalender is full of valuable information and, as can be expected, the accuracy of the tables and other data given can be vouched for. In spite of the imitations which have been published of late, Biedermann's Chemiker-Kalender will remain the standard work.

OTTO RAUBENHEIMER, PH.M.